

The Effect of a Formalized Mentorship Program on Pre-Pharmacy Students' Perceptions
of Themselves as Pharmacy Students

by

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ABSTRACT

Mentoring programs are not uncommon. In fact, they are more common than we think. Most mentoring programs and/or mentorship opportunities are informal and happen daily. While mentorship programs are common, some programs, specifically Pre-Pharmacy related, are overlooked. The lack of formalized opportunities impacts prospective students' understanding of the profession and connection-building and limits accessibility to resources. This study explored the role of participation in the Mentoring Aspiring Pre-Pharmacy Mentorship Programs (MAPPS) on the mentees' self-efficacy, belonging, and decision to pursue pharmacy. I conducted this four-week study at UC San Diego Skaggs School of Pharmacy and Pharmaceutical Sciences (SSPPS) in collaboration with the undergraduate campus. To support self-efficacy, belonging, and the decision to pursue pharmacy, MAPPS incorporated didactic and non-didactic activities, group conversations, reflections, and much more. To foster belonging, mentees were provided opportunities to participate in Pharmacy and Faculty meet and greet events, choose their mentor groups, and engage with one another. To develop self-efficacy, mentees were encouraged weekly to step outside their comfort zone by completing reflection activities that challenged them to learn more about the profession and engage with their mentors. The theoretical perspectives that guided this research project were the identity theory, self-efficacy theory, and sense of belonging. Furthermore, I used the parallel mixed design approach, which allowed me to use a mix of quantitative and qualitative methods simultaneously or with some time-lapse. The data collected in this study showed that participation in the MAPPS mentorship program

heightened the mentees' sense of belonging, developed a deeper understanding of the profession, and resulted in the mentee feeling empowered to pursue the profession.

DEDICATION

This study is dedicated to all the incredible UC San Diego participants-faculty, staff, undergraduate and graduate students for their time, dedication, and vulnerability. Your involvement has not only expanded my knowledge but will continue to make significant contributions to mentorship programs.

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This dissertation journey has been a challenging yet rewarding experience. As I think back to my first day of classes, I can't help but think about all the uncertainties everyone in the world experienced. March 2020 was not only when the world shut down because of the novel COVID-19 virus, but it was also when the Maroon Cohort started their Ed.D. journey. I experienced a lot of self-doubt and was not sure what I should do next. However, the unwavering support I received from the faculty and staff reassured me that I was here for a reason.

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CHAPTER 1

INTRODUCTION

"We all should know that diversity makes for a rich tapestry, and we must understand that all the threads of the tapestry are equal in value no matter what their color."

- Maya Angelou

Growing up in San Diego, I have had the great fortune to learn from those different from me. Reflecting on my K-12 learning experience, I came to realize that many of my friends came from diverse backgrounds, and how that afforded me the opportunity to gain experience and appreciate their cultures. Those experiences allowed me to be culturally sensitive and in return, it has helped me understand and embrace students from different walks of life.

As a higher education professional, I think back to my undergraduate experiences, and I remember the first time I felt a lack of belongingness. I was a first-year student attending a small rural university in western Oklahoma, and a classmate asked me where I was from because I looked different. When I told them I was Iranian, they proceeded to tell me that I was the first Iranian that they had met. Thinking back on that conversation, it reminds me of the emotions (culture shock, feeling out of place) I felt and how it changed my perception of the college I was attending. As a student who experienced a lack of belongingness, I understand the uttermost importance of creating inclusion and encouraging cultural diversity in education.

Unfortunately, my story is not uncommon. As an Iranian-American woman who attended college in western Oklahoma, I knew my experiences and interactions would motivate me to have influence in students' educational experience, specifically focusing

on belongingness. Research has shown that fostering an inclusive environment can encourage student success. Thomas (2012) describes a sense of belongingness as feeling valued, included, and encouraged by others (teacher and peers) in the academic classroom setting, and feeling oneself be an important part of the life activity of the class. More than simply perceived liking or warmth, it also involves support and respect for personal autonomy and for the student as an individual.

Working at one of the University of California (UC), specifically at UC San Diego Skaggs School of Pharmacy and Pharmaceutical Sciences (SSPPS) as an admissions officer, I have witnessed students, especially those from underrepresented backgrounds, struggle with believing our program is a fit for them because they do not see "people like them" here. As a person who is all too familiar with those feelings, I recognize that to achieve diversity and inclusion in my particular institution and Pharmacy profession, there must be a shift in the paradigm to allow this change.

As diversity increases in higher education, institutions are challenged to create a sense of belongingness and accessibility for all students. To address these challenges, institutions can utilize mentorship programs as a key component in their support strategies. Seaver (2019) states that students who are entering an unfamiliar environment, and who may have uncertainties will need additional validation from mentors. Additionally, he states that validation is integral to the student being able to connect with the identity of the college or university and that will allow them to develop a sense of belonging (Seaver, 2019). Within this area of research, Collier (2017) discusses that student success is not just students demonstrating their academic abilities, but rather, students being able to transition from their previous institution (i.e., high school,

community college etc.) and being able to adapt to their new environment. Lastly, Collier (2017) emphasizes that mentor and mentee relationships that share a common perspective will result in the mentee following the advice of their mentor, thus leading to academic success.

Unfortunately, previous research has largely overlooked the benefits of mentorship programs for Pre-Pharmacy students, as I will further explain in chapter two. Bearing that in mind and based on my firsthand experiences with mentorship, my dissertation study investigated the impact of a four-week mentoring program on students' self-efficacy and sense of belonging at UC San Diego. Furthermore, I explored how participation in a formalized mentorship influenced students' decisions to pursue pharmacy.

Specifically, the study explored the following research questions:

1. What is the role of participation in the MAPPS mentorship program for undergraduate students' decisions to pursue Pharmacy School?
2. How does participation in the MAPPS mentorship program relate to undergraduate students' self-efficacy?
3. How does participation in the MAPPS mentorship program influence a sense of belonging for undergraduate students?

The four- week program I created is named Mentoring Aspiring Pre-Pharmacy Students (MAPPS). The MAPPS mentorship program seeks to promote diversity, a sense of belonging, and understanding the unique challenges Pre-Pharmacy students face through the pre-application process.

The MAPPS program incorporates learning modules that allow participants to increase their knowledge about the profession of pharmacy, dispel any misconceptions they may have about the field- which may lead to concerns about entering the profession and empower them to pursue pharmacy school. My intention for creating MAPPS is to provide a safe and encouraging space for those with shared interests and values to build rapport and meaningful relationships- something that I wished I had as an undergraduate student.

Definitions

Underrepresented Minority Students: African American, Hispanic/Latino American, Asian/Pacific Islander American, and Native American.

Mentor: an experienced and trusted advisor (Art of Mentoring, n.d.).

Mentoring: advising and training someone (Art of Mentoring, n.d.).

Formal Mentoring Program: structured and has an intentional purpose (IHEP, 2011, pg.2).

Informal Mentoring Program: naturally occurring relationship between two people where one gains insight, knowledge, wisdom, friendship, and support (IHEP, 2011, pg.2).

CANVAS Learning Management System (LMS): CANVAS is a learning management system- institutions, educators, and students use it to access and manage online courses (Instructure, n.d.).

Larger Context

Sir Isaac Newton once said, “If I have seen further, it is by standing on the shoulders of giants” (Elshaikh, n.d.). What did Isaac Newton mean by that? He was explaining that his ideas did not come from him alone, rather he relied on the ideas of

those who came before him (Elshaikh, n.d.). This quote describes the importance of collective learning, which not only plays a critical role in our growth and self-efficacy, but also promotes diversity. Furthermore, mentorship provides students the opportunity to feel a sense of belonging, which in return can motivate them to pursue their goal and help increase diversity in healthcare systems. Despite decades of research on mentorship and self-efficacy, and belonging, there has not been much regarding mentorship for Pre-Pharmacy students.

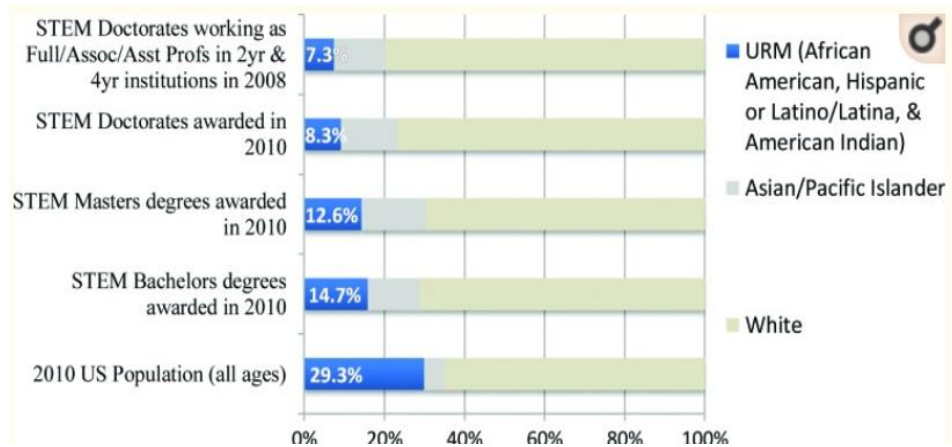
In the United States, Underrepresented minorities (URMs), African Americans, American Indians/Alaska Natives, and Latinos, currently constitute 30% of the population. By 2050, it is predicted that URMs will account for greater than 40% of the US population (NACME, 2013). While our nation is increasing in diversity, there is still a persistent lack of diversity amongst healthcare workers. The National Institute of Health reported that the lack of representation in healthcare negatively affects the patient experience (NIH, 2022). Like many areas of healthcare, the profession of pharmacy lacks representation. According to Zippia.com (n.d.), only 4.4% of Pharmacists self-identify as Hispanic or Latino. With this information in mind, higher education professionals must plan to learn more about the barriers and perceptions that students face when it comes to pursuing not only a Pharmacy degree but any STEM-related degree. By recognizing and responding to the unequal opportunities URM students face in the pharmacy field, more minorities will feel compelled to pursue health-related programs.

While it has been acknowledged that college leaders have made positive strides towards increasing minority enrollment and degree attainments, however, the data continues to show the disparity in STEM degree attainment for URM students (Estrada et

al., 2016). Figure 1 below outlines the current percentages of URM students, White, and Asian/Pacific Islander populations with STEM degrees in the U.S.A.

Figure 1.

Stem Degrees Attainment for URM Students (Estrada et al., 2016)

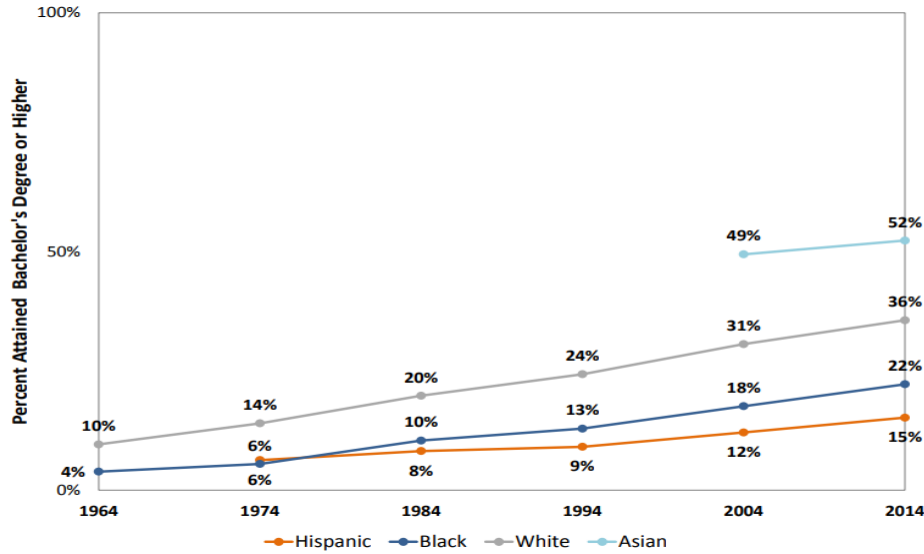


Note. Figure 1 In this analysis “STEM Degrees” include degrees categorized by the NSF as “Science and Engineering.” Degrees in psychology and social sciences are excluded. This data was prepared by the U.S. Department of Education's IPEDS 2010 Completions Survey

Furthermore, a report published by the U.S. Department of Education (DOE) (2017) found that the gap in bachelor’s degree attainment between Black and Whites and Hispanic and Whites has widened. From 1974 to 2014, the gap between Hispanic and White bachelor’s degree attainment has doubled from 9% to 20% and the gap between Black and White bachelor degree attainment from 6% (1964) to 13% (2013) (U.S. Department of Education, 20217). This information can be found in Figure 2.

Figure 2.

Percentage of Attained Bachelor’s Degrees for Years 1964-2014



Note. Figure 2 outlines the percent (%) Attained bachelor's degree or Higher from 1964 to 2014 between Hispanics, Blacks, Whites, and Asians.

One of the major findings by the DOE regarding gaps in college opportunities is that many of the disparities students experience are *before* graduating high school, which itself seems to be a foundational issue for many minorities and first-generation students. In a qualitative study conducted at Georgetown and Harvard, Gable (2021) followed two cohorts of first-generation college students and their continuing generation peers to learn more about their educational experiences. During one of Gable's semi-structured interviews, she spoke with a first-generation student who describes feeling intimidated and less prepared for the Ivy League curriculum. Gable explained that the student, a first-generation American from a low-income background and an under-resourced public high school, felt intimidated by her professors despite her objective academic accomplishments in college. Feeling underprepared coming out of high school has had significant effects on students (confidence, identity development) and this is a topic that I explored during my own previous research (Gable, 2021).

Kricorian et al. (2020) address several factors that may influence URM participation in the field of STEM. These factors include mentorship experiences, their academic mindsets, STEM attitudes, and family background characteristics. Additionally, Kricorian et al. (2020), discusses how important the academic mindset is and how a lack of belonging and or “acceptance” can lead to one thinking they are unfit. Creating a sense of social belonging can perhaps start with mentorship in the pre-application phase and eventually bring awareness to other areas of programs and institutions that could also benefit from being socially responsive.

Although many mentorship programs have been created, not all of these programs can affirm that they have been effective. A considerable issue with many mentorship programs is that they are not offered at the correct times during the student life cycle, or there are not enough resources to maintain the program. According to the Art of Mentoring (n.d.), the common pitfalls in mentoring programs are lack of training for mentors and mentees, too much or not enough structure, poor matching and ignoring the checkpoints. Previous research by The Institute for Higher Education Policy (IHEP, 2011) states that transition from high school to college can be successful if students are provided with resources, guidance, and mentors that nurture students' college aspirations. Furthermore, the IHEP looks at how first-year students who received out-of-class mentoring from faculty increased academic achievement and are significantly more likely to return for a second year.

To elaborate on Gable’s findings regarding first-generation students who come from disadvantaged backgrounds feeling less prepared for the Ivy League curriculum, Harackiewicz et al. (2014) further explore the achievement gaps in first-year college

courses who are biology majors. In their study *Closing the Social Class Achievement Gap for First-Generation Students in Undergraduate Biology*, the authors found that first-generation URM students and women enter college with the hopes to pursue bioscience but are quickly discouraged because they struggle in introductory Biology. Furthermore, they emphasize that no prior research has attempted to close the gap for first-generation students, a population that makes up nearly a fifth of college students. In the study, the researchers found that students who received a grade of B or better felt that they could make it in this field versus receiving a C grade. In addition, the authors reiterate how crucial it is for first-generation students to have a positive experience in their first biology course- because it will determine if they continue with the bioscience field (Harackiewicz et al., 2014). Bearing this information in mind, I strongly believe implementing a program like MAPPS during the most impressionable years (Freshmen, Sophomore years) can be beneficial to students who may need extra guidance.

The undergraduate level can be the most impressionable time for students and designing mentoring programs during those times can lead to a boost in their self-efficacy. Gable describes how being prepared can result in a sense of belonging early in one's college experience, which can lead to a thriving social experience. Gable goes on to describe that feeling poorly equipped, specifically for first-generation college students, can cause considerable psychological strain in the first weeks and months of college (pg. 62).

Digging deeper into belonging, it is no secret that we are attracted to things and people who create a sense of inclusion. According to the OECD (2017), when students feel part of a community, they are more likely to perform better academically and be

motivated to learn. More importantly, we must explore how a sense of belongingness is associated with creating identity and self-efficacy, for students pursuing a career in Pharmacy. Creating a sense of belonging where students can identify with others, can be done through mentorship programs- if they are facilitated and implemented correctly.

Does mentorship truly cultivate a sense of belonging and self-efficacy? Researchers at the Department of Social and Behavioral Sciences, University of California, San Francisco focused on how mentorship and research experience during Junior and Senior year of college positively related to student science efficacy, identity, and values at the same time period (Estrada et al., 2018). Previous research has shown that URM students who can feel and identify as scientists and belong in the community are more likely to act consistently with the expectations of the role and pursue a STEM career. Furthermore, the authors describe mentoring as the second core component of intervention programs and the three factors that provide a positive outcome for the protege. First, mentors can provide instrumental support, providing resources and opportunities to engage in goal attainment. Second, psychological support occurs when a mentor enhances the individual's sense of competence, identity, and effectiveness in the *professional role*. Third, relationship quality and or relationship satisfaction. Relationship quality is an important piece because it builds trust, empathy, respect, and connection (Estrada et al., 2018).

When students are not provided with the same opportunities as their counterparts, they lose the college-going self-efficacy required to succeed. Helping all students develop strong identities and mindset while fostering inclusion in academic settings through the

MAPPS program, will not only diversify UC San Diego SSPPS but will also enrich our students' experience and learning.

Local Research Context

Mission- Vision and Values

The mission of UC San Diego Skaggs School of Pharmacy and Pharmaceutical Sciences (SSPPS) is to educate future pharmacists and scientists to become leaders in diverse fields, transform pharmacy and pharmaceutical sciences, and improve human health (UC San Diego, n.d.).

Vision

The vision of SSPPS is to be a catalyst for creative approaches and excellence in pharmacy and pharmaceutical sciences education, discovery, and service from local to global communities.

Values

We will uphold the same values shared on the campus of UC San Diego. We will achieve our mission by being distinctive and by using our comparative advantage. The values that define UC San Diego create an environment and a culture where:

- Excellence in teaching, research, patient care, and a people- and service-oriented culture that supports learning, scholarly work, and public service are the norm.
- Collaborative and interdisciplinary activities lead to discoveries, technologies, cures, scholarship, and creative works that advance and enrich society.

- Diversity, equity, and inclusion enable academics, students, and staff to excel and provide opportunity for all to succeed.
- An entrepreneurial spirit leads to agility, taking risks, and creating innovative approaches to solving problems is encouraged.
- Public engagement, sustainability, integrity, and ethics are core principles guiding our activities.

History

The UCs are an extensive and prestigious system that offers students many degree options. UC San Diego is one of nine campuses throughout the state of California. Five out of nine campuses have medical centers (UC Systems, 2020). UC San Diego Skaggs School of Pharmacy and Pharmaceutical Sciences (SSPPS) is a nonprofit public program that was founded in 2002 and had their first graduating class of 24 students in 2006 (UC San Diego Health). At the time, SSPPS was the second public school of pharmacy in the state and the *only* pharmacy school in Southern California. Those 24 students were pioneers, and 20 years later they paved the path for many students to continue their journey to becoming a pharmacist (UC San Diego Health).

At UC San Diego, the Health Sciences Campus is tucked away in a quiet and serene area in La Jolla, CA. One of the many benefits of our campus is the close proximity to the UC Health Systems. Being separated from the main campus, which has approximately 30,000 students, provides our graduate students with a quieter and more professional community. This also allows our students to have access to the specific resources required to succeed, like the Biomedical Sciences Library and research

facilities. Although we pride ourselves on being close to the Health Systems and our extensive health sciences campus, the best part about our Southern California location is being minutes away from the beach, which provides our students with opportunities to break free from everyday demands.

UC San Diego SSPPS has a very successful pharmacy program, ranking #1 for the North American Pharmacist Licensure Examination (NAPLEX) amongst 143 other schools of pharmacy. Between 2018-2022, our pharmacy graduates had a 100% pass rate on the NAPLEX (The North American Pharmacist Licensure exam) exam. Our program is innovative and places a firm belief in collaboration, thus leading to the Honors/Pass/No Pass (H/P/NP) grading system. With our unique grading system, we encourage students to work together regardless of their grades. Furthermore, to promote engagement on a deeper level, SSPPS has an integrative year two curriculum where Year 2 Pharmacy students take classes with Year 1 School of Medicine students. Our curriculum structure is unique to SSPPS, and no other school of pharmacy currently offers that level of collaboration. We believe fostering a collaborative environment increases engagement and awareness for other roles that healthcare professionals hold in the health system. This results in creating healthcare leaders that work together as a team in the professional setting.

SSPPS Academic Programs

A Doctor of Pharmacy degree is not the only academic program available at SSPPS. Prospective students can explore and pursue the Seven-Year B.S. Chemistry/Doctor of Pharmacy, Dual Pharm.D./Ph.D. program, Ph.D. Pharmaceutical Sciences and Drug development and Masters in Drug Development and Product Management.

However, it is important to note that the Ph.D. and Master's programs are not directly managed at SSPPS (UC San Diego SSPPS, n.d.). The Seven-Year program is an accelerated pathway available to UC San Diego first-time freshman students. The seven-year program combines 3 years of undergraduate studies and 4 years of pharmacy school, into a total of 7-years. The dual Pharm.D./Ph.D. program is offered to students after they have completed their first 2 years of pharmacy school. The Ph.D. and Master's programs are available to students who wish to pursue non-clinical pharmacy degrees.

Amongst the variety of benefits available to students, SSPPS must identify the gaps in our organizational structure that affect prospective students from pursuing pharmacy. SSPPS must expand its student population across its various degree programs to include all categories of underrepresented students. This change would require a thorough internal and external assessment of these students' unique challenges in applying to, attending, and succeeding in college. Increasing diversity in the classroom will allow students to become culturally sensitive and aware early on; therefore, they will carry that knowledge as they become Pharmacists and healthcare leaders.

SSPPS Student Demographics

Understanding how SSPPS is contributing to diversifying the profession of pharmacy will be critical to how the school approaches its internal efforts. As of 2022, SSPPS has 257 pharmacy students. When considering this information, it is important to note the gap between student demographics. In 2022, the following students make up our student demographic; 162 Asian/ Pacific Islander, 57 White, 0 American Indian, 5 Black/ African-American, and 14 students who chose not to identify. This data shows the disproportionate enrollment rates of the different student demographics.

To my surprise, I learned that SSPPS is not the only School of Pharmacy in California facing diversity recruitment challenges. According to Alonzo et al. (2019), "the average enrollment of URM students in pharmacy programs *nationally* was 12.3% in 2005, compared to 12.4% in 2014. The average enrollment of URM students in *California* pharmacy schools was 9.4% in 2005 compared to 8.5% in 2014." Furthermore, Alonzo et al. state that URM patients are more likely to select health care professionals with whom they can quickly identify and report a higher satisfaction rate. I have witnessed my grandparents feeling more comfortable with Iranian-American health care professionals, not only because it alleviated the language barrier, but also felt a sense of comfort and self-identification.

Through this dissertation study, I investigated the effectiveness of the MAPPS mentorship program on undergraduate students' self-efficacy and sense of belonging. Mentorship addresses the immediate issues and examines student trends on a deeper level, allowing administrators to create the necessary changes to enhance the student experience.

Significance of the Study

The significance of this study is to explore the impact on student self-efficacy, sense of belonging, and decision to pursue a pharmacy degree of participation in the MAPPS mentoring program. Through this dissertation study, I intended to shed light on the importance of structured mentorship and why more than ever, it is important to work with students during all stages of their college careers. Creswell et al. (2014) explain that research studies are needed to fill gaps in existing literature about the research problem. Currently, there is a lack of research in the existing literature in regard to mentorship

programs for Pre-Pharmacy students. The findings of this study can address the importance and need for mentorship programs specifically for Pre-Pharmacy students. In addition, the findings of this study may also justify the importance of providing students with accessibility to information regarding the profession of pharmacy to dispel any misconceptions they may have. Beyond SSPPS, this information can allow college administrators to reevaluate their resources, with the hopes of creating *equitable* opportunities for all students.

Action Research Study

This dissertation study takes the form of action research. Mertler (2020) defines action research as the systematic inquiry conducted by educational professionals whose purpose is to gather information about how their institutions operate, teach, and how their students learn (pg. 5). Furthermore, action research allows educational professionals to conduct research for themselves and study their surroundings. This type of research is enticing because it provides the educational professional the opportunity to be a practitioner in the realm of education and self-reflect. Mertler outlines the steps as:

Action Research Steps

- Identify and limit the topic
 - Gather information
 - Review the related research
 - Develop a research plan
 - Implement the plan and collect the data
 - Analyze the data
 - Develop an action plan
 - Share and communicate the results
 - Reflect on the research process
-

Using Mertler's steps, I strategically planned and completed two preliminary 'cycles' of research (called cycle 0 and cycle 1) in preparation for the dissertation study.

In this section, I describe these two cycles of study, their goals, methods, and the findings from each.

Preface- Cycles 0 and 1

The findings in cycles 0 and 1 were conducted with the focus on perceptions and barriers of Hispanic/Latino Pre-Pharmacy students. After much discussion with my dissertation committee, regarding California (CA) Proposition 209- Affirmative Action Initiative (1996), I revised the dissertation study to include all participants. This change allowed the MAPPS program to be compliant with California (CA) Proposition 209. CA Prop 209 ensures that the state cannot discriminate against or grant preferential treatment on the basis of race, sex, color, ethnicity, or national origin in the operation of public employment, public education, and public contracting (Ballotpedia, n.d.).

Cycle 0 Study

For cycle 0, I conducted virtual semi-structured interviews to better understand the URM student's journey from three different perspectives. Two of the interviewees identify as minorities, and the importance of their interviews is that one of them attended the UCs in the 90s not only for his undergraduate degree but also for pharmacy school and the other is a current pharmacy student. I wanted to learn if some of the challenges are still occurring for URM students. Lastly, I interviewed a Dean, who is also a Professor at SSPPS to learn more about the challenges that URM students have encountered during the pre-application process. I will refer to the Dean as participant A, the practicing pharmacist as participant B, and the student as participant C.

I chose these three participants because they all have contributed to a URM student's journey directly or indirectly. Participant A's perceptions and encounters with

URM students during the admissions process were essential to record because they provided insight into how our institution has addressed URM student barriers in the past. During cycle 0 research, she was able to discuss the obstacles that she has observed over the last five years and what efforts were made by the admissions team. By understanding this early on in my research, I started looking for trends. Participant B brought much awareness to the barriers that he experienced 15 years ago, which is comparable to the current barriers that not only Hispanic/Latino students face but URM students in general. Lastly, participant C, who is also the only male African-American student in his class, described in great detail the feeling of belongingness and self-identification.

After reviewing the semi-structured interviews there were four recurring themes:

1. accessibility to resources or pharmacy experience, 2. feeling of belongingness and identity, 3. importance of mentorship, and 4. emotional and physical barriers. Based on the information collected from the interviews, I learned that URM Pre-Pharmacy students face many barriers and that there is a lack of mentorship available, which in return leads to applicants deterring from the profession.

One of the major factors that all three participants identified is the need for mentorship and its importance. Participant B, who has been practicing Pharmacy for over 15 years, mentioned barriers that he faced during his time that are not uncommon for present-day URM students. Participants B and C both expressed that the lack of representation in the field of Pharmacy creates a barrier for belongingness and can hinder a URM student's motivation to pursue Pharmacy. All three participants stated that creating a sense of community can help overcome a lack of self-identification. In

addition, all participants found that mentorship and pharmacy experience will allow an applicant to feel confident to pursue the field of Pharmacy.

Cycle 1 Study

Building on the findings from my cycle 0 study, and to learn more about the educational inequities that URM applicants faced during the pre-application process, I planned a PharmCAS Re-Application Workshop for my cycle one study. PharmCAS is the centralized application service that applicants can use to apply to pharmacy school(s). The application process can be intimidating and tedious for students, especially if they have never filled out a graduate school application.

My sample pool for cycle one research included thirty-one URM applicants who fell in the "*Denied Before Interview*" status. Each applicant received an email, inviting them to participate in a pre- and post-survey and a workshop. The surveys created and administered utilized the mixed-methods approach, focusing on understanding what resources were available to URM applicants in the pre-application process and understanding any barriers they may have experienced. My goal was to gather concrete and insightful data from URM Pre-Pharmacy Students regarding their Pre-Pharmacy resources, and perceptions, which would allow me to better construct the mentorship program implemented in the dissertation study.

My survey yielded a low response rate. Four applicants participated, but only three applicants completed the survey. Additionally, I invited all applicants who received the survey to the workshop event, but unfortunately, none of the applicants attended. As part of my cycle one research, I asked the Project Manager of Equity, Diversity, and Inclusion to participate as a workshop observer and then engage in a post-workshop

interview. I will refer to him as Participant A. The purpose of the discussion was to learn more about what Participant A observed, my presentation, and his knowledge and perceptions of URM student journeys in education. Since the workshop did not take place, I moved forward with the interview, using questions that measured Participant A's knowledge and perception of URM students in education.

To collect additional data, I decided to use those same perception-based questions to interview two URM Pre-Pharmacy students, specifically Hispanic students. Participant B was a Latina, First-Generation student who is a third-year Biochemistry major. Participant B expressed interest in Pharmacy after participating in the Research Methodology Training Laboratory (RMTL) Program. Participant C was a third-year Chemical Engineering student who, like Participant B, expressed interest in Pharmacy after speaking with the Director of the RMTL program. These interviews were significant to my research because after I conducted cycle 0, I decided to shift my student demographic focus from URM students to Hispanic/Latino applicants. I will explain this reasoning with the insightful data gathered from the PharmCAS 2020-2021 application cycle.

After reviewing the national data for pharmacist demographics, the number of URM applicants denied this application cycle, and coding my two student interviews; I concurred that Hispanic/Latino students are the most in need of a mentorship program. In this application cycle, thirty-one URM applicants were denied before the interview, and 61% of those denials were Hispanic/ Latino identifying students. Lastly, Hispanics make up the largest minority group in the United States, yet only 4.5% are Pharmacists.

My first interview was with Participant A, the Project Manager of EDI and shortly thereafter, I manually coded the interview. I came up with six codes and three themes. According to Ivankova (2015), the process of analyzing qualitative research is called the *inductive approach*. The inductive approach aims at reducing the volume of qualitative research by organizing the data into categories and themes. She goes on to explain that practitioners can use three types of codes; 1. Emergent- codes developed from the text, 2. Predetermined codes that are derived *deductively* from literature and theory and are applied to code the text and 3. Combination of emergent (inductive) and predetermined (deductive). Since there were very few responses to my survey, and three interviews, I used the Mixed-Methods Data Analysis in a Sequential Quan -> Qual MMAR Design because it allowed me to conduct mixed-methods data analysis by sequentially connecting the results from *two* chronological study strands with the intentions of explaining the joint results. This design provided me with a more in-depth understanding of the issue.

The reoccurring interview trends consisted of perception and the importance of mentorship and community. While each applicant had their definition of mentorship, there was one common theme, that mentorship serves as the glue between the student and the administrator. To identify trends and themes, I systematically categorized my excerpts to find common codes. After coding all three interviews, I observed six common themes and three major codes. The common themes included: self-perception/ identity, college conversations, environment/ community, mentorship, networks, and first-generation. The three codes that I used to categorize my findings were: Emotions, Relationships, and Student Demographics.

All participants in the interviews discussed how mentorship not only builds rapport but how it shifts the perception of how they see themselves as future pharmacists. Another important matter worth mentioning was identifying with the profession by seeing those like themselves as practicing Pharmacists, which is the foundation of the identity theory. Participant B stated:

And I am also a biochem major, and I knew that he was Latino, and I am also Latina. Just like being able to identify with him in that sense, and like having that conversation with him, I am noticing trends in the conversations and things that I have found in research regarding identification through mentorship. When he said yeah, it was difficult, and you know being underprivileged, the minority has different challenges that you know are placed before you, but you can overcome them. You're just as good as anyone else who does decide to pursue pharmacy.

Another significant discussion took place with Participant C. He discussed the importance of community and how that allowed him to become confident, build studying skills and become successful in his academics. He also described feeling disconnected from the UC community before joining a fraternity and how that feeling of disconnection inhibited him from being successful.

So, for fall quarter, I was rushing a fraternity at that time, and so that, on top of all of the extra stuff that I was doing, I knew it would pay off in the long run, just because it gave me, you know another leadership position, just to have on my resume. But the fraternity also did require some study hours, which I benefited from because it forced me to develop a schedule in order for me to fit those hours in and just dedicate that time to it, so I

think that preparation and fall led to the success and winter. And this is mainly for minorities, people of color are the Community aspect. It's really hard for you to succeed in a place where you feel disconnected from, you know, the campus environment, where you feel unable to find those places where you can be comfortable and allow yourself to focus on the school. There's so many other topics that you have to be aware of on campus for a person of color that I feel other individuals don't have to be wary of.

The codes and the themes from the interview with our project manager complemented the student interviews and the individual survey response. Many of the trends Participant A observed in STEM-related academia over the past twenty years seem to be recurring. During the interview with Participant A, he mentioned that many URM students do not see themselves as pharmacists, because of their environment and they also do not have the opportunity to discuss their goals with their families because they are unable to relate to what the student is doing and feeling. This was a topic that was also discussed with Participants B and C. Self-perception was periodically discussed in the empirical findings and was alluded to as one of the most significant barriers. Furthermore, I was able to examine how individual perceptions shift once they can claim an identity that closely attributes to themselves. The individuals can create greater meaning, interpret it as approval, and are more persistent in fulfilling their goals.

Another compelling part of my research that deserves recognition was the pre-survey. I acknowledge that my survey had a low response rate, which impacted my quantitative data, however, one applicant who responded, who happens to be Latino, discussed the barriers that he experienced as a Pre-Pharmacy student. When asked, *I had*

adequate resources for a Pre-Pharmacy Student (Likert Scale 1-5; Strongly-Strongly Disagree), the respondent strongly disagreed. Additionally, they were prompted to tell us a little more about the resources they had or wish they had, and they provided a vague response of “Skaggs admission.” The same respondent strongly disagreed when asked *I am confident that my support and resources, I received from UC San Diego SSPPS helped me prepare for the Pharmacy School Application* (Likert Scale 1-5; Strongly-Strongly Disagree) and no further explanation was provided. While I understand there were limitations from my survey, it triggered my curiosity and I questioned the opportunity gaps existing in education, specifically within our institution.

Summary of Findings

During cycle 0 and 1 research studies, I had many meaningful conversations that allowed me to reflect on the Hispanic/Latino student journey and the challenges they faced reaching the same goals as their counterparts. The common themes in cycle 0 semi-structured interviews were accessibility to resources, feeling of belongingness and identity, emotional and physical barriers, and mentorship's importance. These findings persuaded me to learn more about these limitations from the student's perspective. During cycle 1 research, I spoke with undergraduate Hispanic students who expressed the same sentiments as the interviewees in cycle 0. But the most revealing findings from cycle 1 was that the students experienced the same obstacles that Participant B (cycle 0) encountered nearly 15 years earlier. After my conversations with the undergraduate students, I couldn't help but be grateful for their transparency and vulnerability. By creating and implementing the MAPPS program for my dissertation study, I planned to implement a program where students have access to resources, faculty and peer-to-peer

mentorship, pharmacy insight opportunities, feel empowered and most importantly, be part of a program that promotes representation.

Research Questions

To gain a better understanding of the impact mentorship programs have on a student's belonging, self-efficacy and decision making, I constructed this research study with the following research questions:

1. What is the role of participation in the MAPPS mentorship program for undergraduate students' decisions to pursue Pharmacy School?
2. How does participation in the MAPPs mentorship program relate to undergraduate students' self-efficacy?
3. How does participation in the MAPPS mentorship program influence a sense of belonging for undergraduate students?

To examine these questions further, I utilized the mixed-methods approach incorporating pre and post surveys, semi-structured interviews, and various activities that can be found within the module-based learning platform, CANVAS (details in chapter three), situated within self-efficacy theory and literature on the importance of mentorship as described in chapter two.

CHAPTER 2

REVIEW OF SCHOLARLY LITERATURE AND PRACTITIONER KNOWLEDGE

"Research is to see what everybody else has seen, and to think what nobody else has thought." - Albert Szent- Gyorgyi

It was Summer 2010, and I had just finished all the requirements of my healthcare internship course in my undergraduate program. This was a year-long course and students were required to shadow healthcare providers in various settings (i.e., acute care, palliative, in/outpatient, etc.). I thought that by that point in my program, I would have a solid understanding of what field of healthcare I wanted to pursue. Yet, I was still discouraged and doubted that healthcare was right for me. I made an appointment with my advisor, a faculty member, to seek guidance. Upon arrival, I was optimistic and thought that I would be ready for the next steps after my conversation. I was wrong. After my discussion with my faculty mentor, I felt that he did not take the time to understand my goals and concerns. In that moment, I did not feel a sense of belonging in the sciences.

At that time, I worked as a student assistant for the Dean of Arts and Sciences. I provided general scheduling advising for freshmen students, mainly for URM and first-generation students. It wasn't until my own experience with my advisor that I realized how important communication and mentorship were. Mentors play a critical role in student success, and they can assist students with navigating through the complexities, and the uncertainties of college life. Keeping that in mind, I knew how important building relationships would be for students, especially when it came to adapting to the new environment.

Theories have a powerful way of explaining certain phenomena and viewing the world through a different lens. Theories allow us to learn more about our ideas and how previous researchers utilized those theories to guide their research. Before theories, everything began with an idea. An idea is something that is driven not only by our passion but our previous experiences. As we evolve with our research, we learn to understand how impactful those ideas truly are.

In the literature, many scholars agree that mentorship is an effective tool and can help foster belongingness and aid in identity development. However, there is limited research exploring the impact of mentorship on identity development for URM, more specifically Pre-Pharmacy students. Current research in the health sciences heavily focuses on pre-medical students and general STEM majors' perspectives and barriers. The theories and research discussed in this chapter will explore mentorship and how it influences students' decision to pursue pharmacy and describe theories of self-efficacy, the importance of fostering a sense of belonging. These issues, and the research into them, help provide a foundation on which my dissertation study was built.

Identity Theory

Identity, what is it? In essence, it's how we see ourselves or how we answer, "Who am I?" Finding yourself and answering that question can be challenging for many of us, but I can't help but wonder, what sets apart those who can answer that question. Understanding self-identity is multifaceted and for minority students who do not have mentors that they can identify with, it can make answering that question even more challenging.

Identity Theory offers a strong basis for understanding the importance of creating belongingness for all students. Atkins et al. (2020) state "according to identity theory, when individuals claim an identity, they attribute to themselves a set of meanings about their role, group membership, or unique personhood. This identity process includes first seeing oneself as having a particular identity, then experiencing verification from others of one's identity, and ultimately viewing an identity as prominent". Identity theory helps explain how powerful it is to see someone like yourself in a particular role and it allows the individual to create a sense of belonging. Atkins et al. state that the most important factor associated with the mentee's determination was that they shared the same values as their mentor. This information was uncovered in a study where the researchers examined mentoring relationships in the Chancellor's Science Scholars (CSS). The CSS program was created to help increase the number of URM individuals who obtain doctorates in science. The core CSS program value was mentorship- both formal and informal mentoring strategies were implemented, and the program's goal was to influence scientific identity through mentorship. Atkins et al. reported that sixteen out of 24 respondents indicated that, some extent they saw themselves as scientists and they attributed this to the mentorship they were provided (Atkins et al., 2020). To further explain the relationship of identity and self, Ragins (2009) describes positive selves which represent the self in the future or who would like to become. The emotional connection that is fostered through the mentor-mentee program is what allowed the two participants in my earlier study (cycle one) to explore the field of pharmacy.

When implemented early, social-identity development can help a student feel comfortable and confident with their occupational development. For many students,

specifically minority students, seeing themselves as a pharmacist may not be the first career choice. Aceves-Blumenthal (1992) discusses these phenomenon's in Hispanic students. She ties together identity and self, stating that to select a career, the expected occupational role must be congruent with the person's concept of self, therefore, selection of a career must be consistent with the self-picture. If Hispanics do not see themselves as pharmacists, they will not become pharmacists. Furthermore, Blumenthal highlights that in addition to choosing pharmacy as a career, there are barriers specific to minorities in the admissions process. Barriers such as real or self-imposed language barriers, which restrict the applicants' performance on the PCAT, finances, cultural and motivational issues, lack of role models, recruitment tools for minority students (awareness of the profession). In addition to the topics discussed, Blumenthal emphasizes the lack of images of pharmacists in the media and that the media selected physicians, research scientists or pharmaceutical representatives as their drug experts. By doing that, that did not allow for others to perceive the profession as prestigious (1992).

Within this area of investigation, Manongsong and Ghosh (2021) studied the development of positive identity through mentorship in minority women leaders in higher education. Manongsong et al. described the importance of personal identification and how a lack of it can impair the development of deep-level connection and trust between minority women mentees and their mentors. Moreover, the authors found that a safe and non-judgmental space fostered by the mentor/coach can prevent minoritized women from experiencing anxiety for not having a fully developed sense of self and later encourage them to allow for a positive leader identity (2021) . This information, coupled with the conversations that took place in my research cycle 1 study regarding the value of having

a mentor that the mentee can identify with, inspired me to continue developing a mentorship program, and helped lay the groundwork for the dissertation study.

Mentorship: Formal vs. Informal

Mentorship is a rewarding experience and provides many benefits. For example, the IHEP (2011) states that mentorship positively influences college-going experiences and college success. Students who received mentorship were motivated towards achieving their goals, discussed going to college with their mentors- especially with mentors who have similar experiences, and mentors provided students with relevant information and resources. Furthermore, a study conducted in Philadelphia found that students who were enrolled in the Philadelphia-based Sponsor-a-scholar mentoring and scholarship program improved their grades and enrolled in college at a *significantly* higher rate than their peers who did not (IHEP, 2011, pg.3).

Mentorship programs can be approached in two different ways: informal and formal. The IHEP describes informal mentoring as naturally occurring, supportive relationships students develop with more experienced individuals (i.e., parents, family friends, neighbors, teachers etc.). Informal mentoring provides the mentee with general guidance and helps the student learn something new. In addition, informal mentorship can provide long-lasting positive impacts on students and are far more common than formal mentor programs (IHEP, 2011).

Formal mentorship involves a structured and *intentional* approach to offering students experiences and benefits similar to informal mentoring. Moreover, formal mentoring is facilitated, and the mentoring relationship can be peer to peer or with an older more experienced mentor (IHEP). For my dissertation study, I implemented a

formalized mentorship program with weekly activities centered around self-efficacy, and belonging, while supporting the mentees' journey to understand more about the pharmacy profession.

Self-efficacy Theory

Belief- a word that carries so much power, yet many of us struggle with it. During my undergraduate years, I had a classmate who was a first-generation student. At the time, I did not understand what she meant by first-generation, and I was curious to learn more about her experiences. She explained that she was the first one in her family to attend college. I remember her emphasizing the importance of finishing her degree and going to medical school because it would help her family build a better future. Some of the adversities she faced were adapting to the college culture, lack of campus support, and navigating through the medical school application. Her determination, resilience, and belief in her own ability (her self-efficacy) helped her overcome the obstacles she faced and ultimately reach her goal of going to medical school.

In 1977, psychologist and Stanford professor Albert Bandura coined the term "self-efficacy" (Garrido, 2020). Bandura defined self-efficacy as people's beliefs in their capacity to exercise control over their own functioning and events that affect their lives (Garrido, 2020). Bandura explained that research has linked high self-efficacy with numerous benefits to daily life, such as resilience to adversity and stress, healthy lifestyle habits, improved performance, and *educational achievement*. How is self-efficacy developed? Bandura (1977) stated that individuals develop their self-efficacy by four main sources of influence (see figure 3 below): mastery experiences (performance

outcomes), vicarious experiences (social role models), social persuasion, emotional and physiological states.

Figure 3.

Determining Efficacy Judgments, Pennsylvania State University (Garrido, 2020)



Mastery experiences are said to be the most influential source of efficacy information because they provide the most authentic evidence of one's determination to achieve success. One of the best methods when learning a new skill is by actively practicing and having a positive mindset. Having a positive mindset will allow individuals to grow and accept positive role models, which leads us into vicarious experiences. Bandura states that seeing people similar to oneself succeed by continuous efforts increases the *observers* belief that they too can possess those capabilities (Garrido, 2020). Self-efficacy plays a critical role in the contribution to a students' academic success, motivation and learning and Bandura explains that it is not enough to possess the

requisite knowledge and skills to perform a task, the student must also have the *conviction* that they can successfully perform the required behaviors (Bandura, 1997).

Sense of Belonging

Fostering a sense of belonging is creating spaces for acceptance and allowing the students to build emotional connections. The desire to belong and being part of something important plays an integral role in student success. Bush (2020) explored belonging in a study of the social and academic experiences of URM students during pharmacy school. Bush conducted semi-structured interviews with twenty students from a school of pharmacy within a research-intensive institution. During the interviews, students reported that they felt a lack of diversity, feeling unwelcome and that they expressed concerns of cultural competency. Furthermore, the participants voiced that the low sense of belonging was triggered by a lack of racial/ethnic diversity within the school and a host of experiences leading them to feel unwelcome. One participant lamented,

“There aren't really many [URM] professors or faculty members that look like me. There aren't really students that look like me.” Using her fingers as a measure of diverse individuals within the school, another participant noted, “You can count them on one hand...” Other students corroborated the chilly climate, stating, “the overall environment and culture isn't conducive to my overall success,” and “I just want to feel a sense of belonging.” (Bush, 2020)

It is important to note that the participants in Bush’s study acknowledged that the engagement with URM faculty members, mentors, and pharmacy professionals within their programs played a significant role in confirming their interests in pharmacy.

A number of recent studies have examined the importance of belonging and student success. Estrada et al. (2018) explored how mentorship and research experience during junior and senior year of college were positively related to student science efficacy, identity, and values at the same time. In addition, Gopalan et al. explain that psychologists describe belonging as a fundamental human motivation, a “hub” that can facilitate diverse positive outcomes (2019). The authors went on to explain that when college students experience a sense of belongingness, it allows them to engage more deeply with their studies, which in return leads to persistence and success. Gopalan et al. used data from the Beginning Postsecondary Students Longitudinal Study, a nationally representative survey of first-time, first-year, U.S. college students in 2011–2012 (N = 23,750) with a 2-year follow-up. The belonging measure asked students in the spring semester of their first year to indicate their agreement with the statement “I feel that I am a part (SCHOOL)” (1 = strongly disagree, 5 = strongly agree). On average, most students indicated “somewhat agreed” (Gopalan et al., 2019).

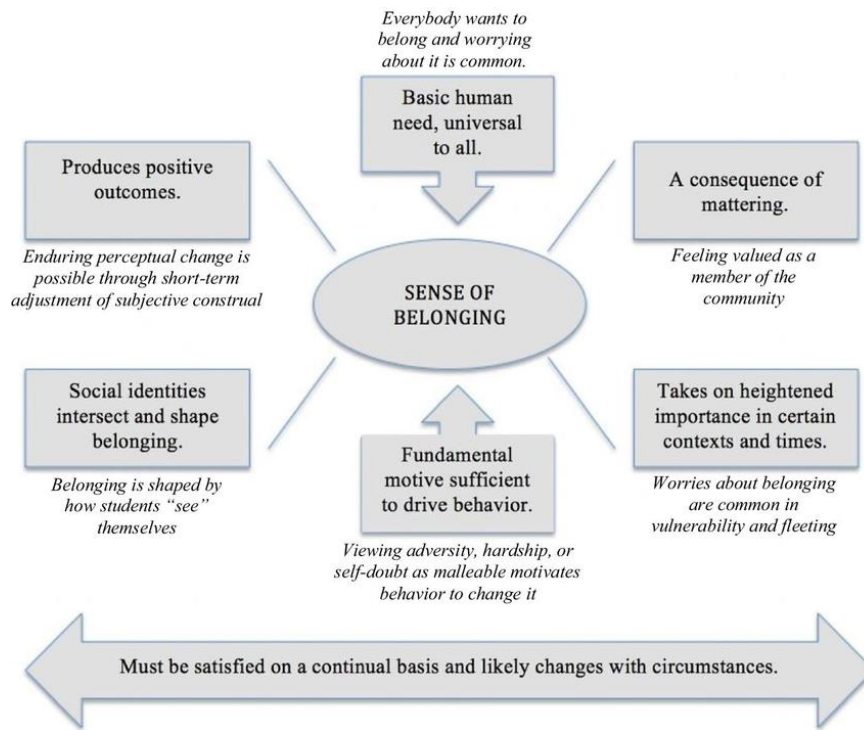
To further understand the impact of belonging, Gopalan et al. explored the association between belonging and student persistence. They found belonging was positively associated with persistence and mental health ($p < 0.05$). One of the major findings of Gopalan et al. suggested that URM and first-generation students at 4-year college reported lower belonging than their peers. A sense of belonging involves more than being connected with other people- it is about gaining acceptance, attention and support and feeling empowered. Herpen et al. (2019) emphasize the importance of transition programs such as bridge programs, first-year seminars and learning communities and how they enhance a sense of belonging and contribute positively to the

intention to persist. Moreover, Strayhorn (2019), author of *College Students' Sense of Belonging*, defines sense of belonging as a “student’s perceived social support on campus, feeling connected, the experience of mattering, accepted, respected, valued by and important to the campus community or others on campus such as faculty, staff and peers”. Strayhorn continues to describe that a sense of belonging in STEM fields are important for undergraduate students, particularly for undergraduate students who face unique challenges in establishing connections. Furthermore, he emphasizes the importance of students, especially minority students participating in in summer or *short-term* programs/ research experiences because previous research shown a *significantly* higher sense of belonging in students who participated in a STEM related program (pgs. 115-116).

To further build on being involved, Strayhorn draws upon previous research that support clubs, organization and *community* support the development of ones’ sense of belonging. Data revealed four ways that involvement bolstered a students’ sense belonging; (1) community or connecting with other students who share the same goals/values (2) familiarizing the students with the new environment (3) *membership* or *affirming the students’ identity* (4) mattering or generating feelings that they matter and others an depend on them. To understand Strayhorn’s work, the framework below outlines the factors that contribute to a student’s sense of belonging.

Figure 4.

Strayhorn’s (2019) Framework of College Student’s Sense of Belonging



Mentorship Models in STEM

To develop the MAPPS mentorship program implemented for my dissertation study, it was critical to understand both the benefits of such programs on student identity and the design elements that support the influence of mentorship in STEM and health education programs. A number of researchers have looked at both of these aspects. At the Medical College of Georgia, they created a Mentorship Model for the Retention of Minority Students (MMRMS) for their Nursing BSN students (Nugent et al. 2004). The research focused on understanding obstacles associated with nursing students' retention from different ethnic groups and the effectiveness of a mentorship program designed to support minority students pursuing health education. The researchers emphasize the importance of the changing demographics and why it is essential to have a diverse and inclusive healthcare team representing the population.

Some of the barriers identified with this research included: financial, inadequate preparation, social adjustments, and the lack of support from the school. The mentorship program started in the Summer of 2001 and 18% of the students entering the program in summer 2001 were African American. The retention rate for this class was 100%, with a graduation rate of 81.3%. Three of the sixteen students did not progress to the senior year due to overwhelming personal problems resulting in a nursing course failure. However, each of these students had remained in the program, successfully repeated the failed course, and progressed to the senior year in fall 2003. African Americans comprised 10% of the entering junior class for summer 2002. As of Fall 2003, this class's retention rate was currently 100%” (Nugent et al. 2004).

Miller et al. (2020) focused more on the psychological aspects that URM students face and how negative feelings like depression and self-doubt could potentially affect academic success. The researchers wanted to measure the potential role that psychological acceptance had on URM doctoral students. The researchers hypothesized that URM doctoral students who have been exposed to higher rates of racial stressors and microaggressions were more stressed and depressed than those who were not. The researchers contacted 344 universities with a research opportunity, and 436 graduate students who identified themselves as URM responded. They used descriptive statistics to learn more about the URM doctoral students. They acknowledged an increase in URM student enrollment in postgraduate studies, however, it took them longer to complete the program. They stated that the longer it took for a URM student to finish the program, the higher the risk of attrition. They also found a *lower sense of belonging* among

participating URM students, which was associated with feeling depressed, anxious, and stressed.

Furthermore, and key to this dissertation study, Miller et al. found that URM students who participated in a “*Bridges to the Doctorate*” mentoring program at the University of Illinois at Chicago successfully gained admission to the doctoral programs and demonstrated a high rate of research productivity. Similarly, Black students in the *Meyerhoff Scholars Program* at the University of Maryland, Baltimore County, are 4.8 times more likely to complete doctoral programs in STEM areas than those not in the program” (Miller et al., 2020). Now, more than ever, especially knowing that how important representation is, SSPPS must create equitable and inclusive mentorship programs and resources that will benefit all students.

CHAPTER 3

METHODOLOGY

"When we seek to discover the best in others, we somehow bring out the best in ourselves." - William Arthur Ward.

Introduction

Research has identified the need for student mentorship programs in the early stages of their undergraduate careers, specifically in STEM. In today's society, where health disparities take many forms, it is imperative to train healthcare leaders who are socially aware and responsive to such disparities. Having students from all walks of life in pharmacy programs allows others to learn from their experiences. According to NCBI (2017), "Health disparities can stem from health inequities—systematic differences in the health of groups and communities occupying unequal positions in society that are avoidable and unjust.”

This chapter provides detailed information about the research setting, the participants, the researcher's role, quantitative and qualitative strategies, the timeline and procedures used in the dissertation study. Furthermore, I will discuss in detail the intervention, the Mentoring Aspiring Pre-Pharmacy Students (MAPPS) program.

Setting

This study took place at UC San Diego, more specifically, at the Skaggs School of Pharmacy and Pharmaceutical Sciences (SSPPS). Every year from July to March, I review applications PharmCAS, prepare for Fall and Winter interviews, participate in admission committee meetings, and discuss the current application cycle while strategically planning for the next cycle with the admissions team. PharmCAS stands for

the Pharmacy College Application Service. PharmCAS is the centralized application service that prospective students use to apply to multiple Doctor of Pharmacy (Pharm.D.) programs. Every application cycle is unique, but SSPPS regularly receives many applications from prospective students eager to interview and fill one of 70 available seats. It is important to mention, SSPPS has one of the smallest pharmacy cohorts in California and has a hard minimum GPA requirement of 3.00. Many pharmacy schools in California have GPA recommendations, not conditions, and have larger class sizes, making our application process intimidating to some.

Participants

The participants of this action research study included UC San Diego undergraduate students, along with current SSPPS students, faculty, staff, and alumni. A total of 29 SSPPS mentors and 65 mentees participated in this program.

Recruitment Plan

Recruitment emails were sent to Directors and Advisors of the following departments in August-September 2022: Biology, Chemistry/ Biochemistry, Public Health, Career center, Health Beat, Black Resource Center, Raza Center, LGBT Resource Center, Office of Academic Support, and Instructional Services (OASIS), and the Research and Methodology Training Lab (RMTL) to help recruit undergraduate students (mentees). Furthermore, the Chemistry and Biochemistry department confirmed approximately 350 biochemistry and chemistry undergraduate students received the recruitment email. The recruitment emails yielded 92 pre-survey responses from undergraduate students. However, only 74 completed the registration form. Out of the 74

students who initially enrolled, 8 withdrew and 1 additional student enrolled after the first week, for a total of 65 participants.

The pre-survey was comprised of three constructs: self-efficacy, belonging and decision to pursue pharmacy. In the body of the recruitment email, a link to the pre-survey was made available. Once the student completed the pre-survey, they were redirected to the registration form. The registration form required mentees to submit their unique identifier and UC San Diego email address. To protect the participant's identity, a unique identifier was required. To create the unique identifier participants used the first three letters of their mother's first name and the last four digits of their phone number (for example if your mother's first name was Sarah and your phone number was 602-543-6789, your code would be Sar 6789). Furthermore, I used the unique identifier to match the pre- and post-survey responses. In addition to the unique identifier, mentees were asked to provide their UC San Diego email addresses. Email addresses were required to enroll mentees in the MAPPS program found on Canvas. Simultaneously, I recruited SSPPS mentors. The mentor interest email yielded 29 responses. Details about the mentors and mentees can be found below.

I aimed to recruit more student mentors because research has proven that peer-to-peer mentorship plays a role in self-efficacy and trust building. Collier (2017) states that peer mentors and the mentee share the college student role, therefore the peer mentor has a better understanding of the mentee's motivation. In return, the peer mentor is seen as being trustworthy. Collier explains that the mentor's motivation for helping the mentee is assumed to be the same as the mentee imagines he would experience when he would help another student. Lastly, Collier further explains that due to the relationship between the

mentor-mentee, the mentor is to be seen as more similar to the mentee than faculty or staff and that the goal of peer mentorship is to assist the mentee in becoming more confident in the role they share with their mentor (Collier, 2017).

Considering this information, I was cognizant of not only recruiting enough student mentors, but also ensuring that our mentors represented students from all backgrounds. This strategy can be referred to as purposeful sampling. Purposive sampling is "a technique widely used in qualitative research for the identification and selection of information-rich cases for the most effective use of limited resources (Patton, 2002)." Additionally, there are different types of purposive sampling. For this project, I employed the "Maximum variation sampling" which allowed me to collect a wide range of participants with different viewpoints to study a certain phenomenon and is useful for uncovering common themes. Working with undergraduates from different academic standings such as freshmen, sophomores, and juniors, during their most impressionable years- especially when they are trying to decide which profession to pursue will provide me with a better understanding of the barriers they are facing.

Mentor Demographics and Pairing Groups Breakdown

The information below highlights the mentors' backgrounds:

1. Six PharmD. faculty
2. Five PhD. faculty
3. Three P1 (pharmacy year 1) mentors
4. Three P2 (pharmacy year 2) mentors
5. Eight P3 (pharmacy year 3) mentors
6. Two P4 (pharmacy year 4) mentors

7. One PharmD/PhD mentor
8. One staff mentor

The mentors were paired into 12 groups and each group consisted of the following combination: practicing pharmacists (Pharm.D.), researchers (Ph.D.), pharmacy students (P1-P4) and one group had a staff member. Seven out 12 mentor groups had 2 mentors, and five groups had 3 mentors. To ensure mentor-mentee balance, four mentor groups were only allowed 5 mentees and all other groups were available to mentor 6 mentees. Sixty- eight mentee spots were available and only 51 mentees signed up (78% of mentees signed up). One mentor group (student and staff) had no mentees sign-up.

Mentee Demographics

The tables below highlight the mentee demographics (N=25) who filled out the pre and post survey.

Table 1.

Pre and Post Survey-Mentee Demographics (n=25)

Q4 Are you of Hispanic, or Latino origin?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	19	76.0	76.0	76.0
	Yes	6	24.0	24.0	100.0
	Total	25	100.0	100.0	

Q5 How would you best describe yourself? - Selected Choice

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	2	8.0	8.0	8.0
Asian	12	48.0	48.0	56.0
Other, please specify:	6	24.0	24.0	80.0
Prefer not to say	1	4.0	4.0	84.0
White	4	16.0	16.0	100.0
Total	25	100.0	100.0	

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	3.7	3.7	3.7
Are you of Hispanic, or Latino origin?				
No	20	74.1	74.1	77.8
Yes	6	22.2	22.2	100.0
Total	27	100.0	100.0	

Q6 I am a First-Generation College Student

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	15	60.0	60.0	60.0
No				
Yes	10	40.0	40.0	100.0
Total	25	100.0	100.0	

Q7 As of today, I am a: (Choose one) - Selected Choice

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	First-year student	7	28.0	28.0	28.0
	Fourth-year student	3	12.0	12.0	40.0
	Other, please specify:	3	12.0	12.0	52.0
	Second-year student	7	28.0	28.0	80.0
	Third-year student	5	20.0	20.0	100.0
	Total	25	100.0	100.0	

Q7 Text- As of today, I am a: (Choose one) - Other, please specify: - Text

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		22	88.0	88.0	88.0
	Fifth year student	1	4.0	4.0	92.0
	Graduated from UCSD in 2021	1	4.0	4.0	96.0
	Transfer student	1	4.0	4.0	100.0
	Total	25	100.0	100.0	

Q8 What degree are you currently pursuing? (i.e. BS Chemistry, BA Psychology etc.)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	B.S. Biochemistry and Cell Biology Minor Psychology	1	4.0	4.0	4.0
	BS Biochemistry	1	4.0	4.0	8.0
	BS Chemistry	4	16.0	16.0	24.0
	BS in Pharmacological Chemistry	1	4.0	4.0	28.0
	BS Pharmacological Chemistry	11	44.0	44.0	72.0
	Molecular and Cell Biology	1	4.0	4.0	76.0
	Pharmacological chemistry	1	4.0	4.0	80.0
	Pharmacological Chemistry	4	16.0	16.0	96.0
	Pharmacological Chemistry BS	1	4.0	4.0	100.0
	Total	25	100.0	100.0	

The Role of the Researcher

About five years ago, I started working at SSPPS and I noticed the absence of mentorship programs for Pre-Pharmacy students. I became curious to know why that was. I also kept thinking back to my undergraduate career and how I did not feel a sense of belongingness and was curious to know if that affected my self-efficacy. In an effort to understand why that was, I evaluated our internal and external factors and realized that not only did research largely overlook the importance of mentorship for Pre-Pharmacy students, but we also did not have any formal processes in place.

My role at SSPPS is unique because I am the only team member that solely focuses on admissions. Because our departments are so small, many teams have only one

or two staff members. Being the main contact person for admissions, I am provided with the opportunity to develop relationships with prospective students from the moment they decide to pursue pharmacy. Working closely with these students, during all stages of their academic career has provided me with an incredible advantage- understanding the student journey, during the good and the bad.

For the dissertation study, I constructed a four-week mentoring program based on research findings and theories. This included designing module activities that promoted self-efficacy and belonging, readings that developed a deeper understanding of the pharmacy profession and dispel misconceptions, organizing meet and greet events, sending daily encouragements and facilitating mentor and mentee relationships. As the researcher, I informally observed the mentees' participation, examined weekly trends, and conducted semi-structured interviews.

Mixed-Methods Research Design

For the dissertation study, I employed a mixed-methods design. Ivankova (2015) defines mixed-methods as research in which the investigator collects and analyzes data, integrates the findings, and draws inferences from both qualitative and quantitative methods in a single study. Mixed-methods research offers investigators “multiple ways of seeing and hearing” by using quantitative and qualitative data collection and analysis, and “multiple ways of making sense of the social world” (p. 9). Teddlie and Tashakkori (2009) emphasize three areas where mixed-methods research can be beneficial. First, the researcher can answer both confirmatory and exploratory research questions in the same study by utilizing quantitative and qualitative methods. Second, the researcher can generate stronger and credible inferences by using both quantitative and qualitative study

results. Lastly the researcher can explore more viewpoints on the same issue by using quantitative and qualitative methods (Teddlie & Tashakkori, 2009).

Furthermore, I used the parallel mixed design, also known as the convergent-parallel approach. Parallel mixed design is a mix of quantitative and qualitative methods that occur in a parallel manner, either simultaneously or with some time lapse (Ivankova, 2015). With this research design, I was able to collect both quantitative and qualitative data simultaneously and compare the results. A YouTube video by the Embraced Wisdom Research Group (2015), emphasizes the importance of merging the results because it provides a holistic interpretation. In addition, the Embraced Wisdom Research Group explains that this method is used when researchers need to collect both quantitative and qualitative types of data, like during an interview or when administering a survey that has both closed and open-ended questions. Using this research method proved to be beneficial for my dissertation study because it provided detailed and contextualized insights and experiences through qualitative data and provided validity through quantitative data. Azorin (2016) states that the central premise of mixed-methods research is the use of quantitative and qualitative approaches in combination to provide a better understanding of the research problems in complex phenomena than just using one approach, thereby enhancing the validity of inferences.

Field Notes

Field notes are a qualitative approach to data collection primarily used in ethnography. While I did not use ethnography research as a foundation for the dissertation study, there are some components of ethnographic research that I employed. Emerson et al. (1995) state that there are two distinct activities of which the ethnographer

must be involved. First, they must enter into the social setting and get to know the individuals involved. By doing this, the ethnographer will develop ongoing relationships, observe what is going on, and will truly have the opportunity to observe the participants. When writing field notes, the researcher must accept that there is no standard for determining if they have enough details. Rather they should look at how closely they can describe what their interest and or research area is (Emerson et al., 1995).

For this dissertation study, my field notes were general observations, like tracking weekly trends such mentee engagement, activities submitted, workshop participation and notes from semi-structured interviews. I chose not to attend and observe a student and the faculty meet and greet event that was included in the study because I wanted to give them the opportunity to engage organically, without my presence. Additionally, mentees were encouraged to prepare for these events by writing down questions/ topic areas they wanted to discuss. By doing this, my goal was to prepare them, so they felt confident in their discussions.

Semi-Structured Interviews

During weeks two and four of the mentorship program, I interviewed six participants. Three of the participants emailed me after the orientation meeting and asked if they could be part of the semi-structured interviews. To recruit more participants, I sent out emails to those who were highly engaged versus those who had little to no engagement. I found this information on Canvas, under the people tab and “total activity.” The applicants who were considered highly engaged agreed to participate in the semi-structured interviews and unfortunately, I never heard back from the low engaging

participants. The interviews lasted approximately 25 minutes and took place during the week on zoom and were recorded and saved to my personal computer.

Pre-and Post-Surveys

To measure the research questions, a mixed-methods pre-and-post survey was administered, that focused on the following constructs: sense of belonging/ sense of social fit, self-efficacy, and decision to pharmacy school. In addition, there were two open-ended questions that measured the mentees' perception of mentorship and their expectation from the MAPPS mentoring program. The first qualitative question asked *What does mentoring mean to you?* And the second qualitative question asked *What are your expectations of the MAPPS mentorship program?* The self-efficacy and sense of belonging/ sense of social fit questions were based on scales found online and were tailored for this research project. The Sense of Social Fit/ Belonging was developed by social psychologists Greg Walton and Geoff Cohen (2007), and it assesses how much a person feels they belong in a group, such as school, club, or academic department (Stanford University, n.d.). In addition, I derived additional questions from a Sense of Belonging scale created by the Imperial College of London (n.d.), which were modified for this project. Both scales utilize a Likert 5-point rating scale (1 = strongly disagree; 3 = neutral; 5 = strongly agree). The self-efficacy questions were also tailored based on the Educational Self-Efficacy scale administered by the Imperial college of London (n.d.), which also applies the Likert 5-point rating scale. In addition to the quantitative data collection, qualitative data was collected through journal reflections, semi-structured interviews, and informal field observations. Further details regarding the qualitative data collection can be found in the section below.

Innovation

The innovation implemented for the dissertation study was a four-week mentorship program called Mentoring Aspiring Pre-Pharmacy Students (MAPPS). I named the program MAPPS because I view education as a journey. The driver, otherwise known as the student, must have the right resources and tools to get to their destination. The advisor should provide additional “fuel” so the student can continue the journey. I designed this innovation on the foundation of my experiences, student experiences and observations, and the need for Pre-Pharmacy mentorship.

The MAPPS program started on Monday, October 10th, 2022, and ended on Sunday, November 6th. Each week, program activities focused on different topics designed to aid student self-efficacy, belonging, and decision to pursue pharmacy. To ensure that the participants were prepared to start the MAPPS program, they were invited and encouraged to join the MAPPS orientation meeting. The goal of the meeting was to provide participants with an overview of the program, outcomes and expectations, course navigation and more importantly, of why they signed up for MAPPS. By doing this, the participants had a clear understanding of the mentorship program. In addition to providing the mentees with an orientation meeting, the mentors (faculty, pharmacy students and staff) were also given resources to help guide them during the MAPPS program. The resources that were made available to the mentors included a welcome email, an orientation video and presentation, and an invitation to join a team group “MAPPS mentor community” on Microsoft Teams. The teams group served as a centralized location for all resources and an opportunity for all mentors to communicate with each other. The orientation video and presentation contained information regarding

the objectives of MAPPS, mentee demographics, why mentees chose MAPPS, mentor pairing groups and guidelines, dates for the SSPPS meet and greet events, communication management, and next steps. Lastly, I asked all mentors to provide background information and a picture so I can include it in the “Mentor Bio” document that the mentees would later use when required to pick their mentor group.

Module-Welcome- Start Here

Mentees were instructed to start with the *Welcome* module, which provided them with a welcome message and information about myself. In addition, this module contained an overview of the MAPPs program (please see below).

Overview of the Modules

Please review the information below before you get started. Reviewing the module overview will allow you to maximize the benefits of this mentorship program and stay on track.

If you have any questions, please email me at: saadibi@health.ucsd.edu

Please note: **2-3 participants will be randomly invited to participate in TWO- 20-min semi-structured interviews. These interviews will take place during weeks 2 and 4.**

Week 1- Introduction Week

1. **Introduction video-** State your name, your undergrad college (Revelle, Thurgood, etc.), some of your favorite hobbies, and what you look forward to in being part of the MAPPs program. **Upload to the discussion board.**

2. **Navigate** to the **GET TO KNOW THE MENTORS** page, choose your mentor pairing, review their bios and write down questions you want to ask your mentors. (Upload assignment)

3. **Email your mentors, and introduce** yourself. Plan to meet with your mentors sometime over the next 4- weeks.

Week 2- Introduction to a Career in Pharmacy.

1. **Journal Pre- Reflection:** Pathways to Pharmacy slides and SSPPS videos about pharmacy areas of specialization. Before reviewing the materials, write down your thoughts and knowledge about the profession of pharmacy (4-5 sentences).

2. **Review** the Pathways to Pharmacy Slides and SSPPS videos

3. **Journal Post-Reflection:** Pathways to Pharmacy slides and SSPPS videos. Discuss what information you found most surprising, what you already knew, and what area(s) of pharmacy interests you (4-5 sentences).

4. **Attend the SSPPS Student group meeting (virtual)-** attendance is not mandatory but highly recommended

Week 3- Pharmacy Week

1. **Reflection-** Reflect on your experiences from weeks 1-2

2. **Attend the Meet and Greet Pharmacist Event (virtual) -** attendance is not mandatory but highly recommended

3. **Reflection-** Meet and Greet Pharmacist Event (1-2 paragraphs) *alternative reflection for those unable to attend.*

Week 4- The End of the MAPPs Journey.

1. **Attend** the next steps meeting with Sahar Adibi

2. **Last journal entry-** reflect on your experiences from weeks 1-4

3. **Complete the Post-Survey**

Module One- Getting Started

The participants started by posting their introduction video and exploring the four modules. The intent of the introduction video was to foster a sense of inclusion, help participants feel more comfortable and learn more about their UC San Diego peers and their goals. In addition to submitting their introduction video, participants reviewed a list of “MAPPS Mentors” biographies that also included their photos. Participants were instructed to review the mentor bios and *then* sign-up for a mentoring pair. The last activity in week one asked participants to submit their mentor questions/ topics, which would be used in their conversations. I also encouraged the participants to complete the activities in sequential order, as if they are following the “*MAPPS Roadmap*.” The major focus of the week was to create a sense of belonging and relationship building. By creating a sense of belonging, my goal for week two was to ignite the participants' self-efficacy.

Module Two- Introduction to a Career in Pharmacy

The activities in this week included focusing on understanding the profession of pharmacy and connecting with SSPPS pharmacy students. Participants started by completing a pre-journal activity that asked them to discuss what they knew about the profession of pharmacy. After completing the pre-journal, they were prompted to review the *Different Pathways of Pharmacy* slides and then reflect on their new-found knowledge in their post-journal entry. In addition to the journal entries, the participants were invited to join a Student Meet and Greet event where they could learn more about pharmacy from a current pharmacy student. Week two focused on overcoming misconceptions through reflection and discussion. Furthermore, week two was designed

to capture the participants' interest in pharmacy, which in return could lead them to pursue the profession.

Module Three- Exploring the Pharmacy and Research Career Path

Week three focused on the participants' reflections of weeks one and two and continued exploration into a career in pharmacy and research through conversations with pharmacists and research professors (PhD) at SSPPS Faculty Meet and Greet event. By now, the participants had had insightful conversations with their chosen mentors, interacted with current students in the meet and greet event and have reflected on their knowledge. These targeted activities continued to reinforce a sense of community and belonging and their motivation (self-efficacy) to learn more about pharmacy.

Module Four- The Beginning and End of your Journey

While week four was the last week for all participants, for some it was the beginning of their journey to pharmacy school. The activities included a *What's Next?* meeting, a post-survey and the MAPPS and Mentor reflection journal. The *What's Next?* meeting provided students with information regarding continued mentorship, and a general timeline of the pharmacy application process. Additionally, I encouraged participants to continue submitting any missing activity.

Support Module: MAPPS Toolkit and Emails

To better support the mentees, I created a MAPPS toolkit module that provided them with Mentee resources and tips, mentee connections discussion board, and information regarding the meet and greet events. The mentee resources and tips page provided the mentees with five tips (1. Initiate the conversation, 2. Honor your commitments, 3. Mentor/ Mentee expectations, 4. Be prepared, 5. Be teachable). These

tips were cited from a YouTube video, “Become Great Mentee- Advice and Tips” (Afzal Hussein, 2020). I also included a mentee connection discussion board where the mentees could connect with one another and watch weekly overview/ recap videos. Unfortunately, the mentees did not engage with one another there.

MAPPS Program outline

The four-weeks MAPPS program and sequence of activities required of the mentees can be found in Table 2. To ensure engagement, I facilitated all the modules.

Table 2.

Four Week MAPPS Program and Activities

WEEK	ACTIVITIES
Week 1- Getting Started	<ol style="list-style-type: none"> 1. Post introduction video 2. Review mentor introduction document 3. Submit: Mentor Questions/ Topics 4. Email your mentors and introduce yourself and set up a time to meet with them (zoom or phone call).
Week 2- Introduction to a Career in Pharmacy	<ol style="list-style-type: none"> 1. Journal- Pre- Reflection Pathways to Pharmacy Slides 2. Review the Pathways to Pharmacy Slides 3. Journal Post- Reflection- Pathways to pharmacy slides 4. SSPPS Student Meet and Greet event <p>**Semi-Structured Interviews</p>
Week 3: Exploring the Pharmacy and Research Career Path	<ol style="list-style-type: none"> 1. Reflection; weeks 1-2 2. Host “Meet and Greet Faculty Event” 3. Reflection Meet and Greet Pharmacist Event
Week 4: The Beginning and End of your journey	<ol style="list-style-type: none"> 1. What’s Next? Meeting 2. Last Journal entry 3. POST- SURVEY (like week 1; pre/post survey comparison). <p>**Semi-Structured Interviews</p>

Data Collection and Analysis

To gather valuable and insightful data, I utilized a mixed-methods approach. Mixed-methods enable the investigator to conceptually integrate qualitative research and qualitative data (i.e., semi-structured interviews, observations, and focus groups) with traditional epidemiological and quantitative methods of research (John Hopkins, n.d.). Most importantly, mixed methods help researcher understand not just if the intervention worked, but how, why and for whom (John Hopkins, n.d.).

As I introduced earlier, the data sources that I used for the dissertation study were pre and post innovation surveys and qualitative journaling and responses. The pre and post quantitative surveys aimed to answer research questions one, two, and three. The surveys also provided me insight on the participants' perceptions on mentorship. In addition, I used a standard scale for both sense of social fit/program and self-efficacy. The sense of social/ program fit explored research question three, *how does participation in the MAPPS mentorship program influence a sense of belonging for Pre-Pharmacy undergraduate students?* The 5-point Likert scale survey explored the participant's perceptions of SSPPS, if they feel connected to the program, and how/if that perception changed after participating in the MAPPS program.

To analyze the participants' responses, I matched the pre and post survey responses using students' unique identifier, which was provided in the registration form. When analyzing the surveys, I only considered responses from those who filled out both pre-and-post surveys. Responses were analyzed using descriptive statistics and the paired samples t-test.

The qualitative methods in this study allowed me to explore the role of mentorship on pursuing pharmacy, self-efficacy and sense of social/ program fit a deeper level. The qualitative methods employed in this project are the pre- and post- survey (mixed-methods), activity journal reflections (Table 2), investigators journal which includes notes from 1:1 semi-structured interviews, and general engagement observations. The 1:1 semi-structured interviews were recorded securely on Zoom, which also provided me with the chat transcripts. Using the chat transcripts and journals, I built coding frames, analyzed the segments, evaluated and cleaned-up the transcripts, and then identified the main codes. Additional information regarding the quantitative and qualitative methods I used can be found below in Table 3.

Table 3.

Quantitative and Qualitative Methods

Quantitative or Qualitative Method	Data Source	Activity Details
Quantitative and Qualitative (mixed-methods survey)	MAPPS Mentorship Program Survey	<ol style="list-style-type: none"> 1. Pre and post innovation 2. Likert Scale along with free responses
Quantitative	Self-efficacy Survey	<ol style="list-style-type: none"> 1. Pre and Post innovation 2. Likert scales
Quantitative	Sense of Social/ Program Fit Survey	<ol style="list-style-type: none"> 1. Pre and Post innovation 2. Likert scales (5-point)
Qualitative	Journal- Reflection Pathways to Pharmacy slide show	<ol style="list-style-type: none"> 1. Pre and post reflection 2. Open-ended, free responses,

			prompts provided
Qualitative	Journal- Meeting with your mentor experience	1. 2.	Open-ended, free response Prompts provided
Qualitative	SSPPS Pharmacy Students Group meeting discussion	1. 2. 3.	Weeks 2 Free discussion Prompts provided
Qualitative	Reflection Journal- Midpoint check	1. 2.	Reflect about week 1-2 Free response, open-ended, prompts provided
Qualitative	Reflection- Meet and Greet faculty event	1. 2.	Week 3 Prompts provided
Qualitative	Semi-Structured Interviews	1. 2.	Weeks 2 and 4 Prompts provided
Qualitative	Last Journal reflection	1. 2.	Reflection of weeks 1-4 Free response, open-ended, prompts provided
Qualitative	Investigators' Journal	1. 2.	Field notes, observations, reflections Weeks 1-4

CHAPTER 4

RESULTS

“If I have seen further than others, it is by standing upon the shoulders of giants.”

Sir Isaac Newton

Chapter four delves into the quantitative and qualitative findings and how they address the research questions. I will first present the quantitative findings, followed by the qualitative findings. As described in previous chapters, the questions guiding my dissertation study are:

1. What is the role of participation in the MAPPS mentorship program for undergraduate students' decisions to pursue Pharmacy School?
2. How does participation in the MAPPs mentorship program relate to undergraduate students' self-efficacy?
3. How does participation in the MAPPS mentorship program influence a sense of belonging for undergraduate students?

Research Question 1

The first research question investigates the role of participating in the MAPPS mentorship program on a mentees decision to pursue pharmacy school. To examine this question, I employed a pre-and-post survey and collected qualitative data. The pre-survey was administered three weeks before the program start date and the post-survey was made available to mentees during the last week of the program. The qualitative data was collected on a weekly basis for four weeks and consisted of journal activities, semi-structured interviews, and workshop opportunities that challenged them to explore the profession of pharmacy.

Research Question 2

Academic self-efficacy can arguably be one of the most principal factors influencing academic performance. Academic self-efficacy is defined as a student's belief and attitude towards their ability to achieve success and their ability to fulfill academic tasks and the learning materials (Hayat et al., 2020). Question two explores how participation in the MAPPS mentorship program relates to the mentees' self-efficacy. To investigate this question, mentees answered questions in the pre-and-post surveys and were encouraged to complete and participate in weekly activities. In addition, to the pre-and-post surveys, I observed the mentees' engagement via Canvas Analytics. Details can be found in the section below.

Research Question 3

Experiencing a feeling of connectedness and belonging to an institution and or program allows all diverse individuals to be seen, heard, welcome and appreciated (Wright-Mair, 2020). The MAPPS program was created to cultivate a sense of belonging through various activities and interactions. Belonging was measured and analyzed by the pre-and-post surveys, journal activities and semi-structured interviews.

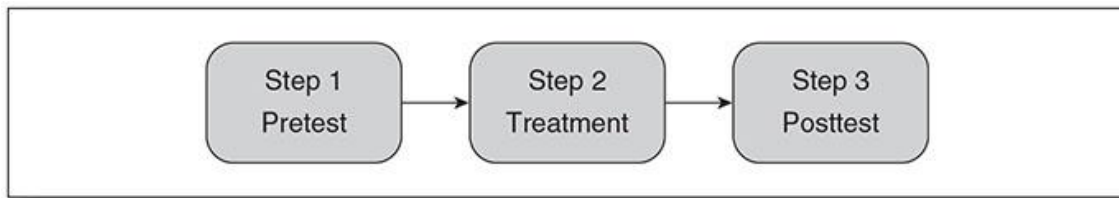
Quantitative Data

The quantitative data collected in this study were based on the mentees' responses to the pre-and-post surveys (N=25). It is important to note that one mentee did not complete the post-survey. The mentee did not answer questions regarding self-efficacy and their perception of mentorship. Therefore, the results for those constructs reflect as N=24. The quantitative data results in the pre-and-post surveys measured the mentees' self-reported sense of belonging, self-efficacy, and decision to pursue pharmacy. The pre-

and-post survey consisted of 37 questions. To analyze the data, I ran a paired sample t-test, which is a statistical procedure used to determine the effectiveness of an implementation using a single group (pretest/ posttest) design that does not require a sizeable n (Knapp, 2018). Additionally, the pretest/ posttest design is sometimes referred to as the simple time-series design or the O X O design (o=observation, x= treatment). Please see Figure 5 below.

Figure 5.

Pretest/Posttest Design



Pre-and Post-MAPPS (innovation) Survey

For all quantitative data, I compared both mean and median scores between pre- and post-test participants. The means were compared using the paired t-test. The medians were compared using the Mann Whitney U tests. All tests were performed using SPSS v28.0 (Armonk, NY. IBM Corp). A p-value threshold of 0.05 was used to denote statistical significance. Questions 18-25 measured belonging, 28-33 measured self-efficacy, questions 16 and 36 measured the role of participating in mentorship program on their decision to pursue pharmacy. Additional questions were related to demographics, how often they would like to speak with the mentors, what skills they perceived to have and information about their availability for workshops. Analysis of the free response questions from the pre-and-post surveys can be found in the qualitative data section below. In addition, the complete survey can be found in the appendix.

After analyzing the pre-and-post MAPPS survey scores, I saw an increase in all 3 constructs: belonging, self-efficacy and perception of mentorship. Self-efficacy and perception of mentorship were not statistically significant, but it is important to note there was not much room for improvement with a Likert scale of 1-5. Mean Self-efficacy scores increased by 0.02 points and perception of mentorship increased by 0.09 points. The survey results indicated significant improvement in the mentees' sense of belonging ($t_{25} = p < 0.05$). After the MAPPS program, mentees reported feeling of connectedness with SSPPS (Table 2 question, $t_{25} = < 0.05$) and the profession of pharmacy, a stronger connection with UC San Diego, and overall increase in their sense of fit. The qualitative data supports the significance found in the quantitative data. While the quantitative data did not show a significant difference in self-efficacy or perception of mentorship, the qualitative data expands on how participating in a mentorship program, like MAPPS impacted students' motivation (self-efficacy) and their new perception of not only the profession but mentorship as well.

Table 4.

Pre and Post MAPPS Survey Results

	M (Pre)	SD (Pre)	M (Post)	SD (Post)	Significance
Sense of Belonging	3.48	0.50	4.01	0.62	<0.001
Self-Efficacy	4.30	0.37	4.32	0.47	0.80
Perception of Mentorship	4.56	0.58	4.65	0.56	0.64

Table 5.

Mean/Median Scores- Survey Questions

Question	Pre-Test Score	Post-Test Mean +-	P-value
Q 18- How connected do you feel with UC San Diego?	3.04 ± 0.84	3.44 ± 0.77	0.02
Q 19- How connected do you feel with SSPPS?	1.92 ± 0.99	3.24 ± 0.97	< 0.01
Q 20- How welcoming have you found UC San Diego to be?	4.04 ± 0.611	4.00 ± 0.82	0.80
Q21- How welcoming have you found SSPPS to be?	3.48 ± 0.87	4.16 ± 0.94	0.004
Q22- I feel my unique background and identity are valued at SSPPS.	3.80 ± 1.08	4.32 ± 0.75	0.01
Q23- There are students at SSPPS to whom I can relate.	3.48 ± 0.71	4.24 ± 0.83	0.001
Q24- All students have the opportunity to succeed at SSPPS.	4.04 ± 0.94	4.44 ± 0.77	0.07
Q25- Please share your agreement with this statement: "I feel a sense of belonging and or fit participating in MAPPS."	4.04 ± 0.74	4.20 ± 0.87	0.38
Q28- Going to college allows me to experience personal satisfaction.	4.58 ± 0.50	4.58 ± 0.50	1.00
Q29- When I succeed in college, I feel important.	4.50 ± 0.13	4.63 ± 0.58	0.33
Q30- I am confident in my academic abilities.	4.00 ± 0.66	4.08 ± 0.72	0.43
Q31- I am comfortable discussing my goals with my MAPPS mentors.	4.54 ± 0.66	4.50 ± 0.66	0.82
Q32- I am confident in my ability to complete all the assignments.	4.38 ± 0.65	4.29 ± 0.81	0.65
Q33- When complicated material is presented, how confident are you that you can understand them?	3.79 ± 0.51	3.83 ± 0.64	0.75
Q16- Please share your agreement with this statement: "Participating in a mentoring program will help me decide if pharmacy is right for me."	4.56 ± 0.65	4.72 ± 0.61	0.44

Q36- I am certain that the activities and resources provided at SSPPS will help me decide if pharmacy is right for me.	4.50 ± 0.66	4.58 ± 0.65	0.66
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Qualitative Data

Results from the qualitative analyses were based on the following data sources; journal reflections, SSPPS pharmacy students group discussions, semi-structured interviews, and my weekly observations. To analyze the qualitative data, I started with choosing the appropriate preparatory coding method. The two methods that I found beneficial were in-vivo and holistic. The in-vivo method keeps the codes directly from the participant and does not alter that information (Saldana, 2009). In-Vivo grants the researcher to derive the code directly from the data, which in return provides insight into the participant's experiences. The second method was the holistic approach. Holistic coding is when the researcher already has a general idea of what to investigate in the data. With the holistic data approach, the researcher can group the data into broad topic areas- this method saves time for those with massive amounts of data and a short period of analytical work (Saldana, 2009, pg. 120). Because I have 12 semi-structured chat transcripts, 122 journal activities, 6 recorded student meet and greet meetings and 2 qualitative free responses (pre-and-post-survey) I decided to employ the holistic approach while simultaneously utilizing in-vivo coding.

First Coding Cycle

In the first coding cycle, I analyzed all the qualitative materials (semi-structured interviews, student meet and greet recordings, qualitative free responses (pre-post-surveys), and journal activities. My focus was broad, and I looked for keywords such as

first-generation, mentorship, belonging, perceptions/ misconceptions (profession of pharmacy), and community. I looked for these keywords because they play a critical role in my cycles 0 and 1 research findings. Furthermore, I wanted to see if those keywords were relevant during my innovation. To my surprise, many of the findings discovered in the previous research cycles were recurring in the MAPPS program. More specifically, findings associated with feeling of belonging, and community. To analyze the data, I utilized the holistic coding method in tandem with the in-vivo method, because this method allowed me to place emphasis on the actual spoken words of the mentees (in-vivo), while I organized the large amounts of data gathered (holistic approach) during the four weeks. The qualitative datasets for the MAPPS program span the period of four weeks, and with large amount of data gathered, I found both methods to be beneficial to my analysis and organization. In addition, I knew the questions, and the activities would provide insight into those specific areas and would allow me to understand and see the challenges through a different lens. Detailed findings can be found below.

Second Coding Cycle

After reviewing all the qualitative data and completing my first coding cycle, I quickly realized the conversations and responses uncovered emotional experiences that the students had experienced at UC San Diego. Saldana (2009) states that emotion coding and values tap into the inner cognitive systems of participants. Furthermore, emotion coding labels the feelings the participants may have experienced. The results of second cycle of coding left me with the following major themes: belonging, community, misconceptions, mentor/ guidance, and emotions. I also uncovered the following sub-themes:

1. Feeling afraid/ shy
2. Alone and disconnected from the UC San Diego community.
3. Craving a sense of community and mentorship
4. Feeling "a lot of pressure," especially since they were first-generation, minority student
5. Feeling "less than," specifically stated by the transfer students
6. Feeling a lack of belonging
7. Imposter syndrome
8. Pharmacy and retail
9. Pharmacy and limited job opportunities
10. Pharmacy and pharmaceutical studies
11. Pharmacy: research vs. clinical

The qualitative data analysis, which will be further broken down into themes in the sections below, examined the relationship between mentorship and belonging and the decision to pursue pharmacy. This study provided substantial insight between mentorship, the mentees' understanding of the profession, and feeling more connected to not only the profession of pharmacy generally, but to the SSPPS in particular. Their connection to SSPPS started to increase as the weeks progressed, especially as they engaged with their mentors and the meet and greet events. For example, all six semi-structured interview participants expressed a sense of increased belonging participating in the activities and having a mentor played a critical role in their decision making. In addition, to feeling more connected, the mentees' knowledge and perception of the pharmacy expanded. This was observed through reading the mentees' journal reflections.

Themes

Each week the mentees were given a set of tasks that were created with the intentions to explore belonging, self-efficacy, and their understanding of the profession. Below you will find descriptions of the themes uncovered.

Week One Themes

The first activity was the introduction video. The purpose of the video was to start the process of building a sense of belonging through common interest. In return, it was hoped that the mentees would be motivated to continue participating in the program. Wilson et al. (2015) states that the link between a sense of belonging and improved academic engagement, achievement, heightened self-confidence, and efficacy. In addition to posting their introduction video, mentees were encouraged to read the mentors' biographies and write down questions and topic areas they wanted to explore. Thirty mentees participated in the introductory video assignment and there was a total of sixty-four comments. The main themes explored from the introductory video and comments are related to belonging, and pharmacy perception. Table 2 outlines the themes found in the introduction videos. In addition to the theme-related keywords, I explored why the mentees joined the MAPPS program. Lastly, nineteen mentees participated in the Mentor Questions/ Topics assignment. From this assignment, I grouped together the major theme-related questions in Table 6, found below.

Table 6.

Themes from Week One's Activity: Introduction Video

Themes

Belonging	<ol style="list-style-type: none"> 1. Looking for a community of “like minded” classmates 2. Develop relationships with mentors 3. I am a freshman and want to meet classmates and mentors 4. Fourth year student and I would like to make connections with other pre-pharm students 5. I want to meet more people who have the same goals as me 6. I am a transfer student, and I don’t know many Pre-Pharmacy students 7. “I am surrounded by so many bio/pre-med majors, and I want to meet more Pre-Pharmacy students”
Pharmacy Perception	<ol style="list-style-type: none"> 8. Clinical and community pharmacy (CVS) 9. Not sure if pharmacy is more than community pharmacy 10. I like research, specifically drug development 11. Learn more about industry pharmacy 12. “Not entirely sure what I can do with a PharmD degree other than working at like CVS or Walgreens”
Why did you join MAPPS?	<ol style="list-style-type: none"> 13. To meet more Pre-Pharmacy students 14. Meet professionals and learn from them 15. Not sure if I should pursue research or clinical 16. I will be able to make a firm decision (PhD or PharmD.) 17. Understand the admissions process 18. Build a relationship with professionals 19. Gain insight and advice 20. Understanding if pharmacy is “the right fit for me” 21. What I can do after completing pharmacy school

Table 7.

Themes from Week One's Activity: Mentor Questions/Topics

Themes	Questions/ Topics
Research vs. Clinical	<ul style="list-style-type: none"> · How similar is working in biotech compared to pharmaceuticals? How much overlap is there? · How did you transition from clinical pharmacy to research? · Difference between Pharm D and PhD · Difference between a clinical work setting and a research work setting · Would having experience in both fields be helpful? · What does research look like in the pharmacy field? · How is it like being a hospital pharmacist? What are some challenges and rewards of being a hospital pharmacist? · As a person in pharmacology, do you think your work is directly impacting people? What is the best approach in getting research experience? · Why or how did you choose pharmacy? · Why did you decide to pursue a pharmacy career instead of another health career?? · How is working at a community pharmacy?
Underserved, equitable	<ul style="list-style-type: none"> · What actions are you taking in order to make healthcare but more specifically pharmacy more equitable to underserved communities?
Pharmacy school (student life/ balance)	<ul style="list-style-type: none"> · What is the social atmosphere like in Skaggs? · What is it like being a student/professor at Skaggs? · How were you able to balance life, school, and other obligations while in pharm school? · What is the daily routine like for a pharmacy student/pharmacist? Is there excitement in this daily routine?
Pharmacy school (admissions)	<ul style="list-style-type: none"> · What experiences do you recommend having before applying to pharmacy school? · Do you have any advice for me to better prepare myself for pharmacy school? · How were pharmacy school interviews? · How should I go about asking for letters of recommendation? · In your opinion, what is the best way to start entering the field of pharmacy, volunteering, or getting a pharmacy technician certification?

Challenges (personal/
professional)

- How can I create an impressive resume/application for Skaggs School of Pharmacy?
 - What did you do prior to pharmacy school to gain experience?
 - How was your application and interview process? What are some tips on having a great/successful application?
 - What are some challenges you overcame during your undergraduate/graduate years? How did you overcome them?
 - Was there ever a point where you doubted what you were doing was what you actually wanted to do in life? How did you process those thoughts and continue forward?
 - What is the biggest piece of advice you could tell your past self, regarding pharmacy?
 - What challenges did you/are you facing most in pharmacy school? How did you/are you overcoming them?
 - How was your transition from undergraduate to graduate school?
-

Week Two Themes

During week two, mentees were encouraged to explore the different pathways of pharmacy through readings and videos. However, before they completed the learning activity, they were challenged to discuss their understanding of the profession in the pre-reflection journal activity. The purpose of this activity was to uncover any *misconceptions* they may have about pharmacy. After completing the readings, they were instructed to complete the post-journal activity. Twenty-four mentees completed the pre-journal and twenty-one completed the post-journal activity. When asked “*Discuss what you know about the different pharmacy career pathways. Your pre-reflection should be 3-5 sentences OR 3-5 bullet points,*” 17 out of 24 (~70.8%) associated the profession of pharmacy with retail and or community pharmacy (i.e., Walgreens, CVS). Other responses included: hospital, patient care, research, development of medications, and community education. Most of the mentees who associated pharmacy with community

pharmacy stated that their knowledge was limited due to their *exposures* to the profession. This reminded me of what Blumenthal emphasized regarding the lack of awareness surrounding the profession. Blumenthal explained that failure or the perception that minority students will not be successful in participating and completing professional programs adds to the barriers in career selection. In addition, Blumenthal explained that most minorities go into community pharmacy because it is the role with which these students were most familiar (1992). Lack of exposure to the profession was a recurring theme in the journal responses. Keywords that I looked for in the pre-and-post journal reflections were misconceptions and community pharmacy. Three mentees described how their lack of knowledge of the profession hindered their ability to explore the profession.

I really don't know much about the different careers in pharmacy. I thought a pharmacy career was just working behind the counter at CVS.”

“My understanding of pharmacy pathways is very limited. The first pathway that comes to mind is the path of community pharmacy; this is the pathway I am most knowledgeable of due to my exposure with it as a patient picking up prescriptions.

While I know clinical pharmacy is an option, I am not too sure on what exactly the responsibilities for this path consist of. I also know that a PharmD would allow one to pursue a career in the pharmaceutical industry, but again, I am not too sure on what a career in this environment would look like.”

“My biggest misconception about the field of pharmacy is that there is only retail work. I think this misconception stemmed from the fact that I have only ever seen

pharmacies in stores like Vons, CVS, etc., and assumed distributing prescription drugs was all pharmacists do.

After reviewing the materials, mentees were asked the following “*Discuss 2-3 new things you learned, did you have any misconceptions about the field of pharmacy? If so, what were they? What area(s) of specialization is/are most interesting to you and why? Any additional information you want to share.*” The most common misconception reported by the mentees highlighted a lack of awareness associated with a pharmacist's responsibilities such as prescribing medications and that the career outlook was limited. However, after reviewing the learning materials, mentees reported newfound knowledge and heightened interest in the profession. One mentee reported that they didn't know about the various pathways and how they believed that doctors were the ones managing medications.

I learned that there are at least 13 different fields of pharmacy, which is very fascinating. I also learned that pharmacists can do just about anything! I always thought that doctors, nurses, and other kinds of specialists were the ones managing cancer treatments, etc., so it's really interesting to find out how big of a role pharmacists have in every healthcare setting.

Unfortunately, the misconception associated with physicians managing medications isn't new. Blumenthal explains that the media generally selects physicians, research scientists or pharmaceutical companies as the spokesperson for drug expertise (1992). Mentees continued to describe their misconception about what they thought they could do with a PharmD. Degree.

Before MAPPS, I expected to end up in community pharmacy, but I always told myself that if I had the opportunity in a different field, I would try to make insulin free because my best friend growing up had diabetes. Then after working in a pharmacy and meeting so many people who couldn't afford other necessary drugs (Eliquis, Xarelto, Januvia, Symbicort), I became interested in ways to help the underinsured.

I didn't realize there were so many areas to pharmacy, I personally feel like the field is underappreciated, where much of it is constituted towards being simply pharmacists. And not the areas of research, inpatient and outpatient fields.

Student Meet and Greet Events

The student meet and greet events took place during week two of MAPPS. Two meeting days were offered so more mentees could participate. Between both events, 30 mentees participated. In the first meeting, 12 SSPPS student mentors participated, and 15 MAPPS mentees participated. In the second meeting, 8 SSPPS student mentors participated, and 15 MAPPS mentees participated. During the first 15 minutes, the mentors started with an ice breaker, and then asked the mentees three questions: (1) What is something new learned about the profession of pharmacy? (2) Have you reached out to your mentors? (3) Before joining the MAPPS program, what pharmacy related resources were aware of? The purpose of these questions was to measure the participants' pharmacy knowledge/ perceptions, self-efficacy, and general knowledge of campus resources. Many mentees expressed that they learned about the different pathways and that the profession was not limited to community and hospital pharmacy. One mentee stated that "they always thought there was one type of pharmacist and they worked with a

researcher to develop drugs.” Another discussed how they only knew about retail pharmacy and how that was not appealing to them. However, after learning about research and the many opportunities available to pharmacists, they were excited to continue exploring the profession.

The participants reported feeling comfortable reaching out to their mentors, because they were given preparatory resources, such as email templates and the “How to Be a Good Mentee” video. Out of the 15 participants, 9 (60%) had reached out to their mentors. The other mentees reported that being in the middle of midterms served as a barrier but will contact their mentors in the coming days. One mentee who connected with their mentors expressed how their initial conversations made them feel like they can “identify” with the profession. Previous research has shown that students who can identify as scientists (i.e., feel they belong in the community) are more likely to pursue that career (Estrada et al., 2018). Another mentee lamented that meeting with other MAPPS students and mentors made them feel “less alone.”

The most interesting responses were in regard to resources. Mentees discussed not being aware of resources or only knowing about the pre-pharmacy society. Out of the 30 mentees who participated, 11 (36%) knew about the Pre-Pharmacy society. A few mentees stated they only knew about the biochemistry and chemistry clubs because those were the two that their major exposed them to. One mentee stated that she is involved on-campus because it provided exposure to resources and networking. Another mentee said that they transferred from a community college, and they were not aware of resources and now they feel relieved knowing that they have a lot of resources available. But the most notable response was from a chemistry major, she said, “before the email, I wasn’t sure

about doing pharmacy. I am a chemistry major, so I wasn't sure about what to do after graduation, but I am glad I got the email.”

Week Three Themes

By now, the mentees had had opportunities to learn through mentor conversations/ meetings, student meet and greet events, and readings. Week three started with a reflection of weeks 1 and 2. This was a free response assignment where I provided them with questions to consider when reflecting. The four open-ended questions were (a) What have you enjoyed about the MAPPS program? (b) What new things have you learned about pharmacy? (c) Has your involvement in the MAPPS program been an eye-opening experience? If so, please explain. (d) How was your view of pharmacy or research changed since participating in the MAPPS program? Twenty-two mentees completed the assignment and many of them described how learning more about pharmacy through the activities and conversations changed their perception of the profession and helped them feel more excited about pursuing pharmacy. One mentee stated “MAPPS has been eye-opening because I was only aware of pharmacist working in a retail setting and a hospital. I was surprised to find out they have so many pathways.” Additionally, some mentees reflected on their communications with the mentors, stating that MAPPS and their mentors impacted their decision to pursue pharmacy.

Mapps has impacted my decision to pursue pharmacy. And I always knew I wanted to go to pharmacy school, but the issue was not having the resources or mentors to talk to. Now that I have more information about admissions and have talked to my mentors about the whole process, it has *motivated me to apply and* again, make me feel less alone

In addition to the reflection assignment, week three's activities continued to foster a sense of inclusion, and knowledge building. Mentees were invited to the faculty meet and greet event. The faculty meet and greet event was structured to provide students with the opportunity to interact with PhD (research) and PharmD (clinical) faculty during two separate sessions. In addition, mentees were encouraged to write down questions they wanted to ask the faculty. During the PhD (research) session, 5 faculty members were present along with 10 mentees. In the PharmD (clinical) session, 6 faculty members were present, and 13 mentees participated. Each session lasted approximately one hour and thirty minutes. The sessions started with a short introduction presentation and then students were randomly assigned to a breakout room. There were three breakout rooms which each had 2-3 faculty members present. After participating in these sessions, mentees were asked to reflect on their experience. This was a free response journal entry, and they were given questions to consider when writing their reflection. The four open-ended questions were (a) Did you learn something new and unexpected? Please explain. (b) What was the most enjoyable part of your experience? (c) How was your perception of clinical pharmacy or research changed? (d) What did you wish you learned more about? For those that could not attend, they were given an alternate assignment, which required the mentee to do their own independent research on their area of interest (clinical or research or both).

Some theme-related codes/ emotions uncovered during week 3 aligned with sense of belonging, relationship building and pharmacy competency. Many mentees described how their interactions with their mentors has positively impacted their decision to pursue

pharmacy and how the MAPPS program has changed their perceptions on the profession.

For example, one participant stated:

So far, I have enjoyed the back-and-forth communication between me and my mentors. I get even more excited about my future in pharmacy the more I learn from them. I have learned many new things about pharmacy, including but not limited to the fact that pharmacists work in a variety of environments besides retail. Yes, my involvement in MAPPS has been an eye-opening experience. My views on pharmacy and research have changed since participating in MAPPS, such that I feel less intimidated by the process than before.

Another mentee noted:

I really enjoyed the fact that I was able to talk with current students of pharmacy and hear their story and how they came to the place they are today. I learned that being a pharmacist isn't only prescribing medication and doing drug research, but also consulting in a variety of fields. It was eye-opening and perhaps my eyes would be even wider after the faculty meet and greets. It has changed in the way that I'm more aware of the different fields pharmacy is currently being applied to. I didn't even think that it is people in pharmacy developing the treatments and therapies before this program.

One mentee discussed their misconception about pharmacy and diversity. They explained how they believed all pharmacy students were the same and followed the same pathway to pharmacy school.

I knew that I had an interest in the field of pharmacy, but I wanted to see what else is new and I am happy that the program has opened my eyes to more

experiences that have repeatedly proved my misconceptions wrong. One of them is the diversity of all the people involved. Somehow, I had the misconception that all of them followed the same chain and were cut from the same cloth. Every student and faculty member are different and has their differences but the same goal, which relieves my misconceptions about my own competence.

Another mentee discussed their fears associated with considering pharmacy and how they do not feel so lonely knowing that there are others pursuing the same pathway.

I've really enjoyed the people and the resources given to us to learn about the pharmacy field. It doesn't feel so lonely anymore that I know more people taking the same path as me...It got rid of some fears and I feel better prepared what to expect from pharmacy school.

There were many insightful responses that spoke directly about the mentees continued relationship building, self-efficacy, perceptions and the impact of the MAPPS program. In addition, I was able to use the reflections to observe their motivation in the program. The mentees that participated in the activities discussed the importance of learning about the profession through their mentors and how that has allowed them to feel part of our program. One mentee who is a first-generation college student reflected on the weekly activities.

I particularly enjoy the weekly meetings that we have had with the faculty and the pharmacy students, as they have all been so kind and welcoming, treating us like we are pharmacy students just like them.

When designing MAPPS, I created with the intent to be inclusive of both research and clinical pharmacy, while providing the mentees accessibility to mentors that could

provide them with the proper guidance. Accessibility to resources and creating inclusive learning environments, serves as a catalyst for belonging and I was able to observe that through the MAPPS program. One mentee discussed how accessibility to mentors and information has been beneficial to her journey.

The MAPPS program has offered a lot of opportunities for me to explore pharmacy school and the pharmacy field in general. Furthermore, by having several meetings with the faculty and the mentors, I received lots of useful and exclusive insight about pharmacy that I would've probably never come across if it wasn't for the MAPPS program.

In addition to creating an inclusive environment, week three aimed to show mentees that pharmacists come from all walks of life, and they have experienced challenges reaching their goals. One mentee reflected on their faculty meet and greet events by describing the importance of speaking to many diverse professionals and how the information provided will guide them to continue exploring the profession of pharmacy.

I love being able to speak to so many individuals with different backgrounds all within the context of pharmacy as it helps me see what opportunities are available to me. I learned that pharmacy is truly such a diverse field and a crucial part of the healthcare system. Learning how much a pharmacist can do and the various settings of pharmacist work (acute care, ambulatory care, specialty treatment, etc.) shows how important of a role they truly play in other patients' lives. My involvement in MAPPS has been an eye-opening experience. Prior to this program, I was almost 99% certain on going somewhere in the clinical side of pharmacy since I work in the research side currently. However, after speaking to

the research faculty at the meet and greet (that I decided to go to last minute) made me realize that my work is part of a greater picture and I found that to be very interesting. Now, I am still very interested in pursuing a PharmD, but I am also adding PharmD/PhD to the list of consideration!

Many of the student reflections described newfound knowledge and excitement regarding their mentor connections. Two mentee reflections stood out to me. First, a mentee described their limited knowledge of the profession and because of their brief working experience as a pharmacy clerk, they had made the decision to investigate other professions. After participating in MAPPS, the mentee reconsidered their decision to look into other career pathways. In the second journal reflection below, a mentee commented on the structure of the MAPPS program, specifically about being allowed to research and discuss the profession with their mentors, instead of being “forced” to learn about specific programs. While the MAPPS program was created on a formal mentorship foundation, many of the activities were created with an informal approach. Allowing the mentees to learn about areas that are important to them and make decisions supports self-efficacy. It affords them the opportunity to believe in their own ability to make decisions. When you empower someone to make their own decisions, they are more likely to stay committed.

I have also enjoyed talking to my mentors and hearing about their experiences navigating both pharmacy school and a career in pharmacy. Since my experience and knowledge in pharmacy was extremely limited coming into the MAPPS program, I have learned a lot--more than I could have imagined. ...Before this program, I was deterred from pursuing pharmacy as I did not enjoy my brief

experience working as a clerk at a community pharmacy. I did not find the environment exciting, and I just couldn't imagine myself pursuing the career of pharmacy as I thought community was all it entailed. However, after MAPPS, I know there are so many more roles pharmacist can go into. Although I am not 100% sure what pathway I will end up pursuing, I am now excited to pursue a career in pharmacy.

When looking at the MAPPS program I can definitely say the way we are allowed to do our own research about pharmacy with the help of the mentors opposed to being forced to learn about the programs is really good...My involvement in MAPPS has been eye-opening because I was so sure I was just going to get a PHD but after MAPPS I set up an appointment with my counselor and I am going to look more into the option of pharmacy school.

Week Four Themes

Week four was the last week for the mentees to submit activities, fill out the post-survey and submit their last journal reflection. The purpose of the last journal reflection, titled: MAPPS & Mentor Reflection, was to understand more about the mentee's newfound knowledge, what they enjoyed most about the program, the relationships they built with their mentors and to discuss how the MAPPS program has impacted them. Seventeen mentees completed this activity and all mentees agreed that the conversations with their mentors changed their perceptions of the profession. One mentee discussed how her mentors made her feel reassured in her abilities.

I enjoyed the conversations with the staff and mentors; my mentors changed my perception of the profession (regarding school), as one of them told me they had

no pharmacy experience prior to attending pharmacy school, which I thought was a necessity. I think MAPPS reassured me in my abilities because I felt pretty intimidated by the acceptance rate, but I feel confident now knowing how to stand out among other applicants.

Furthermore, other mentees discuss about how the MAPPS program allowed them to build meaningful relationships that will resonate with them. One mentee said, “I have made very meaningful connections that will resonate with me for most of my time here as a student because of this program.” Another reflects on about how MAPPS increased her sense of belonging and motivation to pursue a career in pharmacy.

The MAPPS program definitely solidified my decision to pursue a career in pharmacy because it ignited my excitement in learning how drugs interact with each other as discussed in the research faculty meet and greet and having the personal relationships pharmacists have with their patients. MAPPS has really motivated me to apply to Skaggs School of Pharmacy and Pharmaceutical Sciences because of all the wonderful faculty, staff, and students that are inspiring and knowledgeable mentors and pharmacists.

Circling back to Strayhorn’s (2019) finding regarding the importance of short-term programs and the importance of mentors, one mentee describes how invaluable it was to learn from a mentor and not informational materials. In addition, he discusses how the MAPPS program increased his confidence in his decision to pursue pharmacy. This supports research question #2, which explores participation in the MAPPS program and self-efficacy.

Although one can always read and watch videos about pharmacy, speaking directly with individuals who not only work in pharmacy as a whole but also specialize in different areas of pharmacy is undoubtedly invaluable for an aspiring student. Participating in the MAPPS program has cemented my decision to pursue a career in pharmacy. Prior to joining MAPPS, I was fairly certain I wanted to pursue pharmacy, but I did not have enough insight to really justify or feel confident in my decision; however, after speaking with the mentors and participating in the group meetings I now feel confident with my knowledge of pharmacy and I hope to pursue it after completing my undergrad.

Week four was an insightful week for me, because I saw the more vulnerable sides of the mentees. Their reflections were longer and more thoughtful. Reading their reflections, I feel that they were more comfortable discussing their experiences versus week one, where their reflections were a little shorter. In addition, all the mentees had positive feedback regarding how the MAPPS program impacted their decision-making, sense of belonging, not only to SSPPS, but to UC San Diego and how they feel more confident in themselves.

Semi- Structured Interviews

In addition to the journal activities, six mentees participated in semi-structured interviews. The semi-structured interviewees provided profound feelings regarding mentorship, belonging, self-efficacy and their experiences. Participant A identifies as a Hispanic, first-generation, recent UC San Diego graduate, who was a researcher on-campus at the time of the interview. Participant B identifies as Asian and was a freshman. Participant C identifies as White and was a sophomore. Participant D identifies as

Hispanic, Native American, and White. Participant D is also a first-generation student who was a second-year senior. Participant E identifies as a Hispanic first-generation student and was in their senior year, and Participant F identifies as Hispanic, and was in their senior year. The semi-structured interviews lasted about 25 minutes and aimed to explore three major constructs: perceptions of pharmacy, belonging, and self-efficacy. The interviews were conducted during weeks two and four of the mentoring program.

Week Two

To learn more about the mentees, I started each interview by asking them *to tell me a little about themselves and what does mentoring mean to you?* These questions provided me with some background information and their definition of mentoring. All six mentees used the word “guidance” when describing mentorship and that it helps with feeling “confident and connected.” Participant B emphasized the importance of a mentor and mentee relationship by comparing it as a “big sib/ little relationship.” She wanted to have someone help her long-term, not just with academics, but everyday questions.

In addition, I asked each mentee *Why they joined the MAPPS program*, and all reported that they wanted to learn more about pharmacy and more importantly, connect with mentors. Participant F stated he chose to join this program because as a transfer student it was easy to feel imposter syndrome and he create relationships so he could avoid it:

“I chose this mentorship because as a transfer student, I kind of felt that I was going to get imposter syndrome and I really wanted to avoid that.”

Next, I asked *Has participating in MAPPS program impacted your decision to pursue a career in pharmacy?* Since this interview took place during week two, 3 out of

6 (66%) disclosed that they are considering it but are not sure yet. The 3 other participants stated that they are pursuing pharmacy and the factors that led them to choose pharmacy are: previous exposures to the profession (working and or shadowing a pharmacist), being part of the Pre-Pharmacy society and other related communities.

The second part of the semi-structured interviews focused on belonging. The participants were asked the following questions: (1) How long have you been at UC San Diego and describe your experience thus far (2) Have you felt a sense of belonging at UC San Diego- please explain (3) Have you been able to connect with other UC San Diego students while participating in the MAPPS program? (4) Have you been able to connect with your mentors? (5) Can you tell me about a time when you didn't feel like you belonged at UC San Diego? (6) Describe why it's important for you to feel a sense of belonging. The word that all the participants used to describe mentorship is *guidance* and having someone they can relate to. One mentee described what mentorship meant to her:

Mentoring is giving someone guidance and insight on a career or pathway that they experienced. That guidance helps you continue pursuing your goals.

All the participants expressed having some form of informal mentorship, but nothing on a regular basis. After exploring their insight on mentorship, we started discussing their journey as undergraduate students. Four of the participants have been at UC San Diego since their freshman year and the other two were transfer students. Participant A described how family and being connected plays a big part in her culture. However, when she came to UC San Diego she felt "on her own," but after talking with other students, she felt part of a "community." Participant B stated that she is still trying to figure things out since it was only her first quarter. Participants E and F expressed similar feelings

about their transfer student experiences. Participant E said she felt “out of place” because she was in a classroom with younger students, and she felt “imposter syndrome daily” even with having a high-grade point average (GPA). Participant D discussed how she wasn’t sure about which pathway to pursue but after participating in extracurricular activities it allowed her to find her passion. More specifically after interacting with a Hispanic pharmacist prior to the MAPPS program.

The most eye-opening conversation I had was with Participant C. He discussed his feelings of uncertainty and how he knew he wanted to be a healthcare professional but had difficulties finding his “sense of fit.” He said that his experience at UC San Diego has not been particularly good or bad. He described the academic experience has been great and that the chemistry/ biochemistry department has made him feel welcomed. However, the social and club experiences have not been that great. He described his experience below.

I started off on the pre-med track and joined organizations related to that pathway but did not feel a sense of fit. Participating in the MAPPS program thus far has helped me connect with students and mentors that share similar interests and goals.

Lastly, all the mentees expressed that belonging helped them with staying motivated and wanting to continue as a Pre-Pharmacy student.

Week Four

The same six individuals were invited to participate in week four semi-structured interviews. The same questions were asked, but they were instructed to answer with their post-MAPPS impressions. When discussing mentorship, many of them stated that their

definition did not change, but they have a deeper understanding of what mentorship entails. One interviewee described her experience as being eye opening.

The MAPPS program was very eye opening. Before this program I only saw pharmacy as retail pharmacy, so I wasn't too interested in the career because that's all I thought it was. After this experience it has shown me that they can have a lot of responsibilities and it that this profession is versatile. I didn't know that I could switch around my specialization. I thought pharmacy was like medicine, where you had one specialization. After this program, I do know that I want to pursue pharmacy. Now I have to work on preparing for admissions.

Building on mentorship, Participant F (transfer student) described that he was more aware of what goes into providing mentorship and how critical it is to have a mentor.

After these four-weeks in MAPPS I have kind of appreciated mentoring more. In the sense of what it takes to be a mentor. I could tell my group was very dedicated and informative and answer my questions. And now I see that this isn't only in MAPPS, there are mentors in other organizations who want to help you because they were once there. I now have a greater appreciation for mentoring.

Another interviewee commented about how she appreciated being offered mentors and how that opportunity helped her overcome her fears of reaching out to mentors.

This program helped me connect with mentors that I chose, which was helpful. MAPPS gave me the opportunity to interact with current pharmacy students and pharmacists. Before MAPPS I would have been scared to reach out to mentors on my own, but now I realize that reaching out to mentors isn't scary.

Discussing fostering a sense of belonging, participant F explained that she has never met a Hispanic pharmacist and not seeing “Hispanic Pharmacists” is one of the main reasons why she never considered the field. But after connecting with her mentors, who do share a similar background as she has changed her perspective about pharmacy. Perhaps one of the most critical findings of the semi-structured interviews has been the topic of connections and belonging. Not only did the interviewees express connecting with their mentors, but more importantly, with other MAPPS participants. Participant E described his connections built through the MAPPS program, stating that it made him feel less alone.

Mapps helped me connect with other undergraduate students because when I saw their names in the discussion board and then in classroom I was like hey I know you and it made it less intimidating to talk to them because we are in this program together. We can talk about our process and what struggles we are going through. Participant F, another transfer student, expressed the sentiments, but wished she had more time to get to know her undergraduate peers.

I was able to connect with other undergraduate students, but not as much as I wanted to. The student meet and greet events were super helpful when it came to meeting and connecting with peers. It was nice to hear that other students had similar questions as me and now I don't feel like I am competing with them, instead we are working together to learn about the next steps.

The qualitative and quantitative data collected during the four weeks brought much attention to the importance of participation in mentorship programs. This program allowed the mentees to reflect on their goals and build connections with SSPPS and other

UC San Diego undergraduate students. The data collected from both pre-and-post semi-structured interviews indicated that after completing the program, the students felt an increased sense of belonging, heightened awareness of the profession and motivated them to pursue the pharmacy pathway. The mentees affirmed their understanding, belonging and interest in the profession through the many activities and journal reflections.

Regarding the belonging aspect, they were able to build meaningful relationships on a weekly basis through communications with their mentor and meet and greet events. As previously mentioned, belonging plays a critical role in a student's achievement, aspirations, and whether they stay in school (Strayhorn, 2018). The foundation of the MAPPS program focused on identity, sense of belonging, and self-efficacy, while employing a formal mentoring program model. While this was a formal mentoring program, there were many informal aspects incorporated into the program. By allowing the mentees to choose decisions that will impact their future career decisions is a result of enhanced self-efficacy. Lastly, by the end of the four weeks, the mentees were able to express their interest in pursuing pharmacy and felt a sense of connection to SSPPS.

CHAPTER 5
DISCUSSION

“The delicate balance of mentoring someone is not creating them in your own image but giving them the opportunity to create themselves.”

-Steven Spielberg

Introduction

Before starting this action research project, I knew I wanted to make an impact on the Pre-Pharmacy student life cycle, but I wasn't equipped with the right resources and research background. Throughout this project, I have grown as an educational practitioner and gained an incredible perspective of what Pre-Pharmacy students experience during the pre-application process. In addition, this research project has provided me with the opportunity to reflect on my previous experiences and my newfound knowledge. The purpose of this action research study was to investigate how participating in a mentorship program designed specifically for Pre-Pharmacy students impacted their self-efficacy, belonging, and decision to pursue pharmacy school. As previously discussed, (chapter two), the profession of pharmacy is underrepresented, and research has emphasized how critical diversity is to quality patient care. While there are various factors that can lead to the lack of representation, one area that many administrators are starting to focus on is mentorship and providing students equitable opportunities to connect with their programs of interest. Implementing a sense of belonging during the most impressionable stages of the student life cycle can be imperative to their success and motivation to pursue the desired program. After critiquing the resources available, and a knowledge base from the research and information

uncovered in research cycles 0 and 1, I created a mentorship program centered around identity and self-efficacy theories, while incorporating a formal mentorship model. While I cannot change the resources available to all Pre-Pharmacy students, I recognized at SSPPS we were not providing students with a structured mentorship program that provided access to Pre-Pharmacy resources, mentors, and exposure to the profession in the early pre-application stages.

With the information I studied and researched, I quickly learned that there is limited research regarding strategies that promote efficacy and belonging, specifically for Pre-Pharmacy mentorship programs. Bearing that in mind, I created the Mentoring Aspiring Pre-Pharmacy Students (MAPPS) program. To promote an inclusive learning environment, MAPPS was made available for all students regardless of major and academic standing (e.g., freshman, sophomore etc.). To create an effective mentorship program, I employed the following strategies: (1) pharmacy identity development (2) fostering belonging (bonding activities) (3) pharmacy and research career exploration (4) resource equity (5) accessibility to mentors (6) developing critical thinking and decision-making skills that promote self-efficacy. Because these strategies are theoretical based, they can be applied to a wide variety of academic programs.

As the researcher, I methodically framed my research questions so I could explore an area of research that was largely overlooked. With questions below, I designed a mixed-methods study that provided me insight from UC San Diego undergraduates (mentees) through hands-on bonding activities, journal reflections, pre-and-post-surveys and semi-structured interviews. The findings of this study suggest that participating in formal mentorship programs positively impacts a students' sense of belonging and

decision to pursue pharmacy school. While the quantitative data regarding self-efficacy did not show significant changes, the qualitative data found that the participating mentees' felt motivated to continue exploring the profession because their sense of belonging and knowledge of the pharmacy profession had increased through the program - this shift played a critical role in understanding the role of mentorship programs for Pre-Pharmacy students.

The findings of this study shed light on the importance of mentorship programs for Pre-Pharmacy students, specifically at all levels of their academic careers. Often, we focus on the applicants who perceive as "ready" to apply, and we forget those who need guide during their most impressionable years. The experiences of the mentees and the quantitative and qualitative data in this study show a positive outcome between formalized mentorship and belonging and decision to pursue pharmacy. The quantitative data did not show significant difference in self-efficacy, but the mentees were able to express their increased self-efficacy in the quantitative journal responses. This information can be found in the sections below.

This chapter will review the findings, followed by recommendations for future research, more specifically for Pre-Pharmacy mentorship programs, limitations, and my final thoughts.

Discussions of the Findings

These methods provided me with quantitative and qualitative data that supported the benefits of providing Pre-Pharmacy students mentorship. In the sections below, I will describe the findings related to each construct explored in the study: self-efficacy, belonging and decision to pursue pharmacy.

Research Question #1

What is the role of participation in the MAPPS mentorship program for undergraduate students' decisions to pursue Pharmacy School? In the pre-and-post survey, there was a question that asked the mentee if they were considering pharmacy as a profession (I am considering pharmacy as a profession). Out of the 65 enrolled, 80% (52) said “Yes” and ~18% (12) marked “Unsure.” For the 25 who completed both pre and post surveys, 96% (24) reported they are considering the profession and 4% (1) said they were unsure. There was no difference in the post-survey. While the quantitative data did not show any statistically significant differences, the qualitative findings provided strong evidence that participation in MAPPS program influenced their decision to pursue pharmacy. For example, in the last journal reflection, a mentee described why they chose to participate in the MAPPS program and how it influenced their decision to pursue pharmacy.

I was interested in this program because I wanted to know if pharmacy is right for me. Is it possible for someone like me to become a pharmacist? And now that I have been in this program I am sure that I want to take the next steps.

Another mentee described how meaningful it was to have a P4 (4th year pharmacy student) as their mentor, because it helped them feel “less nervous and that they can overcome challenges too.” The findings align with previous research regarding building connections, *identifying* with the field can lead one stay motivated (efficacy) to pursue their goals (cite the study you are referring to here). For example, an undergraduate senior, described how MAPPS solidified her decision to apply to pharmacy school by stating her motivation increased because of “all the wonderful faculty, staff and student

that are inspiring and knowledgeable mentors and pharmacists- it made me feel like I belonged and that I was enough as a person with my skills and background to apply to pharmacy school.” The information uncovered in the qualitative responses of mentees suggest a positive outcomes and students felt the most “motivated” when they were able to identify with mentors who have had shared experiences. This is consistent with identity theory, when individuals claim an identity, they attribute to themselves a set of meanings about their role, group membership, or unique personhood (Burke & Stets, 2009). These meanings are then communicated to others through behaviors and social interactions (Atkins et al., 2020).

Research Question #2

How does participation in the MAPPs mentorship program relate to undergraduate students' self-efficacy? Self-efficacy can be one of the most challenging constructs to measure because it is based on an individual’s belief in themselves. Albert Bandura defined self-efficacy as “an individual’s belief in his or her capacity to execute behaviors necessary to produce specific performance attainments (1997). When creating this program, I was mindful with how many weekly activities I asked the mentees to participate in because I wanted them to be able to engage as much as possible without overwhelming them. Over the course of four weeks, mentees were given 6 activities and 4 opportunities to participate in meet and greet events. A total of 122 assignments were completed, which averaged ~20 assignments per week. Given that there were 65 mentees enrolled in the program, which means roughly 31% of the mentees were submitting weekly assignments. The weekly participation decreased from week and 1 and 2 and from week 2 and 3 and increased in week 4. Week 1, 62 mentees accessed the canvas

course, 31 participated, and 34 did not participate (~48% participation rate). Week 2, 49 mentees accessed the course and only 20 participated, and 45 did not participate (~31% participation rate). The participation decreased by 35%. Week 3 had the lowest participation rate. During this week, 45 mentees accessed the course and only 16 participated and 49 did not participate (~25% participation rate). Participation decreased by ~28%. Week 4, 31 mentees accessed the course and sixteen participated and 49 did not participate. While more mentees accessed the course during the last week, the same number of mentees (16) participated.

To motivate the mentees, the following weekly emails were sent out: (1) Overview of the week video/ email (2) mid-point check-in and (3) weekly recap and I used keywords/ phrases that would trigger connections with our program (e.g. “Hello Future Pharmacists/ Doctors/ Researchers” or your Mentor is excited to meet you and discuss your goals of becoming a doctor etc.). By doing this I was applying Bandura’s “Determining Efficacy Judgements,” specifically, *verbal persuasion and vicarious experiences*. Bandura describes vicarious experiences as “modeling by others” and verbal persuasion as “coaching and feedback” (1997). However, even with the emails, participation was lower than I expected. The quantitative data did not report significant difference in the mentees self-efficacy ($p > 0.05$). Moreover, even with the low participation, self-efficacy was expressed in the qualitative data through key words such as “motivation” and “commitment.” Mentees reported feeling “motivated” to pursue pharmacy, especially after connecting with their mentors. Providing mentees, the opportunity to pick their mentors, provided me with the opportunity to observe self-efficacy. Individuals with high self-efficacy beliefs exhibit greater situational adaptability

and are more confident in their decision making (Leslie & Moilanen, 2010). The qualitative data provided convincing evidence of a link between belonging and self-efficacy.

Research Question #3

How does participation in the MAPPS mentorship program influence a sense of belonging for undergraduate students? Research has shown that fostering a sense of belonging has made a tremendous impact on learners and their self-efficacy. Developing connectedness with mentors and peers, while developing skills, self-efficacy and self-perception will allow one to feel empowered to pursue their personal and professional goals. During one of my semi-structured interviews, a mentee stated that they were not interested in pursuing the profession of pharmacy, because “they had never seen a pharmacist that looked like them.” Her words stuck with me because I, too, had experienced similar feelings. In addition, I couldn’t help but think that she could have missed out on a pursuing a career in pharmacy because of the lack of representation. After spending four weeks with mentors that she chose and identified with, she confirmed that pharmacy is right for her and hopes to apply for Fall 2024.

The results from the quantitative and qualitative findings were complementary and show that participation in mentorship programs positively impact belonging. Mentees in this study were able to connect with practicing pharmacists and student pharmacists, which shifted their perception about the profession of pharmacy and their sense of fit in the profession. Moreover, the findings of this study align with Strayhorn’s (2019) research where he reported students’ sense of belonging increasing after participating in

short-term programs and his emphasis on the influence of community support in the development of belonging.

The mentees described their increased sense of belonging in the semi-structured interviews and in their last journal reflection. One mentee discussed how she felt wished this program was offered to her back in her freshman year to help with community building.

If I got a chance to participate in this program back in my freshman year of undergrad when I didn't have much experience in the field of pharmacy, I think this would have been an incredible opportunity to learn, connect with others and it would have sparked my passion for pharmacy sooner.

Another mentee described how the connections she made were very meaningful and because of those connections it has persuaded her to pursue the profession even more.

Because of my participation in this program, I am even more persuaded to pursue the profession of pharmacy, since I know that I can continue to learn and help others throughout my life. I have made very meaningful connections that will resonate with me for most of my time here as a student because of this program.

One of the most notable journal reflections regarding belonging came from a transfer student, who identified as a first-generation student. He reflected on his experiences during the MAPPS program and how it impacted his perception of the profession and more importantly, his sense of belonging.

I learned many things about the pharmacy profession. I learned that pharmacy has a lot more aspects to it than just clinical work. Research is also part of pharmacy, and you don't have to stick to one path for your whole pharmacy career. I really enjoyed getting to

talk to students with the same aspirations as myself. Also, by communicating with the mentors, it made myself more comfortable with the path I chose. *They also made me feel like I actually belonged in this field, and they helped relieve my doubts that I'm not good enough to be here.* My perception of this profession did change a lot. I thought this path would be a one-way road but instead there's many roads leading off to different aspects of this field. The MAPPS program has impacted my decision to pursue a career in pharmacy. I am more excited than ever to start my education as a pharmacist. This program also got rid of a bunch of fears I had. I learned quite a bit about the basic information of pharmacy. Now, I just have questions on how to make myself a more competitive candidate and small details about the application process. This program really helped with a lot of my fears of pharmacy school. I was walking in the dark not knowing if I was following the right path to become a pharmacist. Now I feel so much comfortable about my path, and I know I'm not alone. There are many students walking the same path as me and I can't wait to work with them in the future.

The quantitative data found in pre-and-post surveys regarding belonging also support the qualitative findings. Questions related to belonging had a significant increase ($p < 0.05$) not only to our program, but also to their institution, UC San Diego.

Participating in the MAPPS program, a formalized mentorship program, was associated with an increased sense of belonging and motivation to (self-efficacy) to continue with the Pre-Pharmacy pathway. This is consistent with the literature that suggests forming relationships derives an increased sense of belonging (Atkins et al., 2020) and the students who are involved in organizations (i.e., clubs, mentoring programs etc.) feel valued and important (Strayhorn, pg. 166, 2019). Additionally, the findings centered

around belonging demonstrate that regardless of being a first-generation college student, transfer student, or first-time freshman, all interviewed participants expressed similar feelings when it came to belonging. In recounting their experiences, two transfer students during the semi-structured interviews expressed feeling “less than” being in a classroom with younger students, while the first-time freshmen students felt “intimidated” by upper class students because they perceived their lack of college experience as being “less than.”

Misconceptions Associated with the Profession of Pharmacy

Misconceptions are part of everyday life and can be associated with limited information, accessibility to mentors/ resources, incorrect assumptions, and biases. The unfortunate part about misconceptions is that they deter you from your goals, which leads to self-doubt and a lack of motivation. During week two, mentees were asked to reflect on their knowledge of the profession. Almost all mentees associated pharmacy with retail pharmacy (e.g., Walgreens, CVS, etc.). A few mentees reported that they were not interested in the profession because they did not want to limit themselves to a “behind the counter profession,” but they still joined this program because they were curious about other pharmaceutical pathways. As mentioned earlier, one mentee said she did not want to pursue pharmacy because of her misconceptions about the profession. She joined MAPPS to learn more about other pharmacy related career opportunities. To her surprise, she learned that the profession of pharmacy has “endless opportunities.” I found that her response was common, as most mentees felt the same way.

After completing the “Different Pathways of Pharmacy” activity in week two, an overwhelming majority of the mentees reported that they were amazed with how much a

pharmacist could do. One mentee said, “I thought pharmacist counted pills and they couldn’t prescribe medications, but now I know they can develop and prescribe medications.” Unfortunately, the misconceptions about the profession are not uncommon. Over 30 years ago, Blumenthal discussed the lack of pharmacy awareness and how it was detrimental to the career outlook. Blumenthal explains that pharmacist is not the forefront of drug discoveries, instead their careers are displayed as behind the counter/ retail pharmacy (1992). Because of this, many do not consider the profession. During a semi-structured interview, a mentee explained that she had only ever seen a retail pharmacist, so her perspective was limited to that role. Furthermore, she has never seen a pharmacist that she could “identify with.”

These and other misconceptions are also noted on the Pharmacy for Me website. Pharmacy For Me is an educational campaign that aims to educate future pharmacists. The website contains information about pharmacy schools, admissions information, and various other resources for Pre-Pharmacy students. It lists the four biggest misconceptions as: pharmacists only count pills, pharmacists are behind the scenes, there isn’t job diversity, and pharmacists are not part of the medical team. However, these assertions are not true. Pharmacy provides a plethora of career pathways outside of the traditional community pharmacies and as new advances and breakthroughs are made, more opportunities become available (Pharmacy for Me, 2017).

Outside of the MAPPS program, I have talked to students who also share similar misconceptions as the mentees. Lack of access to information and to mentors has served as a limitation to the profession. I believe bringing awareness to this profession and

sharing the career opportunities will allow for future students to make informed decisions about pursuing a career in pharmacy.

Limitations

Reflecting on the four-week experience, there were limitations to this study that not only I encountered, but the mentees as well. The two major limitations were the timeframe and the online learning modality. The timeframe posed a challenge because UC San Diego operates on the quarter system model. This means that the courses are 10 weeks long, midterms are held during week 3, and finals are administered during the 11th week. This model can require an adjustment period for some students, especially those who are new to the quarter system. During the semi-structured interviews, the freshmen students both expressed challenges they encountered with the quarter system. One of them described “learning new time management skills in order to manage classes and social life.” To explore this a little more, I analyzed engagement using the Canvas Analytics tool. Out of the 65 mentees, there were 26 (40%) low engaging mentees (< 2 hours- 0 hours total participation). Out of the 26 low engaging mentees, 7 of them did not access the course. Four out of 7 non-participants were freshmen and 3 out of 7 were sophomores.

In addition to the quarter system limitation, the virtual nature limited in-person relationship building not only for the mentor-mentee relationship, but also for peer-to-peer interactions. Some mentees conveyed that they wished for more interactions with their peers, specifically in-person. While in-person may have been ideal, mentees also expressed how the remote sessions allowed for accessibility and flexibility. For the most part, even with the program being fully online, mentors and mentees still found a way to

connect and build relationships. Finally, requiring students to submit a registration form after completing a 36-question survey served as a disadvantage because out of the 92 who filled out the pre-survey, only 75 completed the registration form. I lost about 18% of those who completed the pre-survey.

Recommendations for Future Research

This research study took place at UC San Diego, a public university. The participants, mentors and mentees came from all walks of life. This research project has opened the door to future research in many ways. One area of future research focus would be to follow and evaluate the participating mentees' journey to pharmacy school. By doing this, I could truly see the impact of this mentorship program. Another possible area of future research would be to evaluate survey responses for those students who enrolled in the mentoring program but did not actively participate. To expand on that, I could analyze their pre-survey results and see if there are any trends in their pre-survey responses. In addition, I could compare and analyze the responses from all 92 pre-survey responses to those who enrolled, versus those who completed the pre-and-post surveys. Another area for further research to consider is creating a "Pre-Pharmacy" mentorship program that offers support throughout students' Pre-Pharmacy undergraduate years. This mentorship program could be multifaceted, where clinical and research experience are offered so students are aware of the many pathways that the profession affords. Many Pre-Pharmacy students believe that pharmacy has a limited job outlooks, which was a common misconception discussed by the mentees. By providing hands-on experience, students can further build a sense of connection with the profession.

Similar to the first recommendation, in future studies researchers could administer an incoming pharmacy student survey and ask questions specific to mentorship, belonging and self-efficacy. Then they could compare the responses to those who did not participate in formalized mentorship programs. This information could be beneficial to administration, because they can reevaluate the current resources available to their students and how they can best support students with their current mentorship model (e.g., training for students to become mentors etc.) . In addition, understanding how an incoming student is feeling could allow the school to either pair a current student with an incoming mentee early on. Finally, researchers could create mentor training programs for faculty and staff. Often times we do not realize the complexities associated with mentoring. Because mentoring is a “common” word, one may think the skills are simple: listening and talking. However, being a great mentor requires more than listening and talking. Creating a formalized training program for mentors would allow for *consistent* and *streamlined* mentorship techniques that would allow the mentee to feel supported, comfortable, and confident as they pursued their goals (ideally, you should add a relevant citation here). To create and implement a formal mentorship training program, the curriculum must be assessed and validated. I believe having a similar training program at SSPPS would be beneficial not only for the faculty and staff, but for the students who serve as mentors to the lower classmen.

Post-MAPPS and Final Thoughts

After the completion of the MAPPS program, the twenty-five mentees who completed the pre and post surveys reached out to me and requested continued mentorship. Since November, I have met with all of them and have collaborated with

them to get hands-on experience. I have helped two mentees obtain a pharmacy clerk position at Safeway, and more than 10 of them have been placed at the UC San Diego Free Clinic. In addition, 8 of the freshman are pursuing the accelerated 7-year BS/PharmD pathway and 9 of the sophomores will be applying this summer, for Fall 2024 admissions. Speaking to one of the mentees who will be applying this summer as a 7-year student, she said “Now that I know pharmacy is right for me, I want to get in right away and start my journey.” The other mentees that I stay in touch with have told me that they stay in contact with their mentors because their mentors continue to motivate them to apply to pharmacy school. In addition, I have had many students outside of UC San Diego reach out to me regarding the MAPPS program and asking about future opportunities, which has been a heartwarming experience.

This research study has shown how critical it is to have a mentor, specifically during the most impressionable years of an undergraduate student’s life cycle. Often times, mentorship programs, especially for graduate programs, are offered to students who are already prepared, leaving those who are unsure behind. Instead, we must focus on creating equitable opportunities and resources earlier on. The MAPPS program has allowed undergraduates to explore the profession of pharmacy, build meaningful relationships, and change their perceptions of pharmacy. The students who completed the pre-and-post surveys in this study reported an increase in belonging, and while the self-efficacy boost was not statistically significant, the qualitative data supported an increase in motivation and interest in the profession. Furthermore, an increase of belonging and motivation resulted in a positive outcome to pursue pharmacy. This research aimed to shed light on the overlooked research regarding Pre-Pharmacy students and mentorship

and the availability of mentors. While I understand that the gap in research and mentorship for Pre-Pharmacy is by no means filled by this study, I hope this study drives future research to implement opportunities for a profession that plays a critical role in healthcare.

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APPENDIX A

MAPPS PRE AND POST SURVEY

In the survey, to protect your confidentiality, I will ask you to create a unique identifier known only to you. To create this unique code, use the first three letters of your mother's first name and the last four digits of your phone number. Thus, for example, if your mother's name was Sarah and your phone number was (602) 543-6789, your code would be Sar 6789. The unique identifier will allow us to match your post-intervention survey responses and your retrospective, pre-intervention responses when we analyze the data.

Unique identifier:

Are you of Hispanic, or Latino origin?

3. Yes
4. No
5. Prefer not to say

How would you best describe yourself?

6. American Indian or Alaska Native
7. Asian
8. Black or African American
9. Native Hawaiian or Other Pacific Islander
10. White
11. Other- Please specify
12. Prefer not to say

I am a First-Generation College Student (Definition: A first-generation college student is defined as a student whose parent(s)/legal guardian(s) have not completed a bachelor's degree. This means that you are the first person in your family to attend a four-year college/university to attain a bachelor's degree.)

13. Yes
14. No

As of today, I am a: (Choose one)

15. First-year student
16. Second-year student
17. Third-year student

18. Fourth-year student and above
19. Other- Please specify

What degree are you currently pursuing? (i.e., BS Chemistry, BA Psychology etc.)

I am a Pre-Pharmacy Student

- Yes
- No
- Unsure

If you had to describe a pharmacist in a few sentences, what would you say?

I have participated in a mentoring program specific to pharmacy

20. Yes
21. No
22. Unsure

What does mentoring mean to you?

Do you have a mentor? (A mentor can be faculty advisors, clergy, relative, friend, someone in the desired profession, etc.)
(Formal or informal)?

23. Faculty Advisor
24. College Advisor/ Counselor
25. Clergy
26. Relative
27. Friend
28. Someone in the desired profession
29. Other; please specify

How often would you like to communicate with your mentor?

30. Weekly
31. Biweekly
32. Monthly
33. Other- Please specify

How would you prefer to communicate with your mentor?

34. Phone
35. Email
36. Zoom
37. In-Person
38. Other; please specify

What are your expectations of the MAPPs mentoring program?

My goals for participating in the MAPPs mentoring program are: (check your top 3)

39. Develop skills that will allow me to be more confident as a pre-pharmacy student OR potential pre-pharmacy student
40. Connect with other UC San Diego undergraduate students
41. Network with SSPPS Students and Faculty
42. Feel more part of SSPPS
43. Learn more about the profession of pharmacy
44. Build relationships with SSPPS staff, faculty, and students
45. Other; please specify

Please share your agreement with this statement: "Participating in a mentoring program will help me decide if Pharmacy is right for me."

46. Strongly Agree
47. Agree
48. Neutral
49. Disagree
50. Strongly Disagree

Sense of School/ Program Fit Questions:

For the following sections please indicate your level of agreement with each of these statements regarding teacher leadership. Based on a six-point Likert Scale: 6 = *Strongly Agree*, 5 = *Agree*, 4 = *Slightly Agree*, 3 = *Slightly Disagree*, 2 = *Disagree*, and 1 = *Strongly Disagree*.

How connected do you feel with UC San Diego?

1. Not all connected
2. Slightly connected
3. Somewhat connected
4. Quite connected
5. Extremely connected

How connected do you feel with SSPPS?

6. Not all connected
7. Slightly connected
8. Somewhat connected
9. Quite connected
10. Extremely connected

How welcoming have you found UC San Diego to be?

11. Not all welcoming
12. Slightly welcoming
13. Somewhat welcoming
14. Quite welcoming
15. Extremely welcoming

How welcoming have you found SSPS to be?

16. Not all welcoming
17. Slightly welcoming
18. Somewhat welcoming
19. Quite welcoming
20. Extremely welcoming

I feel my unique background and identity are valued at SSPPS.

21. Strongly disagree
22. Disagree
23. Neither agree or disagree
24. Agree

25. Strongly Agree

There are students at SSPPS that I can relate to.

26. Strongly disagree
27. Disagree
28. Neither agree or disagree
29. Agree
30. Strongly Agree

All students have the opportunity to succeed at SSPPS

31. Strongly disagree
32. Disagree
33. Neither agree or disagree
34. Agree
35. Strongly Agree

Please share your agreement with this statement: "I feel a sense of belonging and or fit participating in MAPPS"

1. Strongly Agree
2. Agree
3. Neutral
4. Disagree
5. Strongly Disagree

Free Response: Please feel free to share any additional comments here

Self-Efficacy Survey Questions

For the following sections please indicate your level of agreement with each of these statements regarding teacher leadership. Based on a six-point Likert Scale: 6 = *Strongly Agree*, 5 = *Agree*, 4 = *Slightly Agree*, 3 = *Slightly Disagree*, 2 = *Disagree*, and 1 = *Strongly Disagree*.

Going to college allows me to experience personal satisfaction.

6. Strongly Agree
7. Agree
8. Neutral
9. Disagree
10. Strongly Disagree

When I succeed in college I feel important.

11. Strongly Agree
12. Agree
13. Neutral
14. Disagree
15. Strongly Disagree

I am confident in my academic abilities.

16. Strongly Agree
17. Agree
18. Neutral
19. Disagree
20. Strongly Disagree

I am comfortable discussing my goals with my MAPPS mentors.

- 21. Strongly Agree
- 22. Agree
- 23. Neutral
- 24. Disagree
- 25. Strongly Disagree

I am confident in my ability to complete all the assignments.

- 26. Strongly Agree
- 27. Agree
- 28. Neutral
- 29. Disagree
- 30. Strongly Disagree

When complicated material is presented, how confident are you that you can understand them?

- 31. Not at all confident
- 32. Not very confident
- 33. Neutral
- 34. Fairly confident
- 35. Very confident

I perceive my skills to be: (check all that apply)

- 1. Communications
- 2. Detail oriented
- 3. Awareness (self and others)
- 4. Working well with others

5. Empathetic
6. Encouraging others to do their best
7. Active listener
8. Networking and building relationships
9. Mentoring others
10. Patience
11. Other; please specify

Of the skills you checked above which of these are congruent to being a successful pharmacy student?

I am certain that the activities and resources provided at SSPPS will help me decide if pharmacy is right for me.

12. Strongly Agree
13. Agree
14. Neutral
15. Disagree
16. Strongly Disagree

APPENDIX B

MAPPS REGISTRATION FORM

1. Full Name
2. UC San Diego Email (required to enroll you in Canvas)
3. Unique Identifier
4. Will you be able to attend the MAPPS orientation on 10/04 from 4:00-5:00 PM (zoom)?

APPENDIX C
RECRUITMENT EMAILS (MENTORS)

Subject: You're invited to join as a mentor! Mentoring Aspiring Pre-Pharmacy Students (MAPPS)

Hi everyone!

I hope this email finds you well. As some of you may know, I am a doctoral candidate in the Mary Lou Fulton Teachers College (MLFTC) at Arizona State University (ASU). I am working under the direction of Dr. Brian Nelson, a faculty member in MLFTC. We are conducting a research study on the Effect of a Formalized Mentorship Program on Pre-Pharmacy Students' Perceptions of Themselves as Pharmacy Students.

The purpose of this study is to provide students with the opportunity to participate in a structured mentorship program where they will have an opportunity to learn more about the field of pharmacy while building a meaningful relationship with SSPPS students and faculty who will serve as their mentors. This mentorship program targets all students, regardless of their major and year they are in college.

With that information, our department can work towards strengthening our mentorship efforts and resources. To learn more about this project, please **click on the attached consent letter**.

Furthermore, I understand that you have other *priorities as faculty*. Therefore, MAPPS has been designed to be manageable and not interfere with your work. Weekly participation is estimated at <2 hours.

If you are interested in serving as a mentor, please fill out the interest form by **September 29th**. The program will start on **Monday, October 10th**.

I appreciate your support and please reach out to me if you have any questions.

Sincerely,
Sahar Adibi

Second Email

Subject: MAPPS Program Q&A- I hope you considering joining the MAPPS program!

I hope this email finds you well. First and foremost, I want to thank you all for taking the time to read my emails and for all your great questions. Furthermore, I want to thank those of you who have signed up. I am only **6 mentors short**, and I would love for you to

consider joining. Below I included some great questions and hopefully this will clear up any confusions regarding the MAPPS program.

1. When does the MAPPS program start and end?

The MAPPS program is a 4-week self-paced program that starts on October 10th and ends on November 4th.

2. Will I be required to meet with mentees in-person?

Nope! All communications can be virtual- you decide if you want to set up a zoom meeting, phone call or communicate via email. The program is very flexible.

3. Will I be advising mentees by myself?

Nope! You will be paired with another mentor (faculty, alumni, or another student)- this will help you tackle questions and create more flexibility in response times.

4. How many mentees will I have?

No more than 5. Please keep in mind, not every participant is engaging. You may receive 5 mentees, but only hear from 2-3.

5. Who will be participating in this program?

This mentorship program is offered to all UC San Diego undergraduate students.

6. How much interaction is required?

Week 1- Little to no interactions- that is Introduction week for the participants. They may email you at the end of the week.

Week 2- Email communication and participating in a 1.5-hour faculty meet and greet event. **If you are only interested in participating in the group discussions, please email me.**

Week 3- Maybe some email communications (< 1-2 hours)

Week 4- The last week- Maybe some email communications (< 1-2 hours)

If you are interested in participating please fill out the mentor interest form by **Sunday, October 2nd**.

Thank you!

Sahar

APPENDIX D

RECRUITMENT EMAILS (CAMPUS/MENTEES)

Subject: You're Invited to join the UC San Diego Skaggs Mentorship program!

Dear (Insert Name/ Organization Name)

I hope this email finds you well. My name is Sahar Adibi, and I am the Director of Admissions at the Skaggs School of Pharmacy and Pharmaceutical Sciences (SSPPS). I am also a doctoral candidate in the Mary Lou Fulton Teachers College (MLFTC) at Arizona State University (ASU). I am working under Dr. Brian Nelson, a faculty member at MLFTC. We are conducting a research study on the Effect of a Formalized Mentorship Program on Pre-Pharmacy Students' Perceptions of Themselves as Pharmacy Students. The formalized mentorship program's name is Mentoring Aspiring Pre-Pharmacy Students (MAPPS).

The objective of the MAPPS program is to learn more about the role of mentorship in self-efficacy, belonging, and the decision to pursue pharmacy. MAPPS is a strategic four-week program (found on UCSD Canvas) incorporating didactic and non-didactic activities, group conversations, reflections, and much more.

Activities include, but are not limited to, meeting with student and faculty mentors, participating in group discussions, and an SSPPS faculty meet and greet event. This mentorship program is available to all UC San Diego students.

Would you please send the following email to all students who are part of (Organization Name/ Degree Pathway) OR post the attached flier? This program is available to all UC San Diego students.

I appreciate your partnership, and please let me know if you have any questions.

Sincerely,
Sahar

Dear Student,

My name is Sahar Adibi, and I am the Director of Admissions at UC San Diego Skaggs School of Pharmacy and Pharmaceutical Sciences (SSPPS). I am also a Doctor of Education candidate in the Mary Lou Fulton Teachers College (MLFTC) at Arizona State University (ASU). I am working under Dr. Brian Nelson, a faculty member at MLFTC. We are conducting a research study on the Effect of a Formalized Mentorship Program on Pre-Pharmacy Students' Perceptions of Themselves as Pharmacy Students.

This study aims to provide students with the opportunity to participate in a structured mentorship program where they can learn more about the field of pharmacy while building a meaningful relationship with SSPPS students and faculty who will serve as their mentors. Please **click on the attached consent letter and flier to learn more about this opportunity.**

As the Director of Admissions, it is important that I capture your thoughts and perspectives on being a Pre-Pharmacy student OR as a student that has considered pharmacy. Your participation will be valuable, and I hope you consider participating.

If you are interested in participating in the 4-week (ONLINE via Canvas) Mentoring Aspiring Pre-Pharmacy Students (MAPPS) program, please fill out the pre-survey/registration form by **September 29th**.

After you have completed the pre-survey, you will be automatically redirected to the orientation registration page. **Please use your UCSD email to register.** Orientation is *not* required but highly recommended.

The program will start on Monday, October 10th.

Furthermore, I understand that your coursework is your *main* priority. Therefore, MAPPS has been designed to be manageable and *not* interfere with your academics. Weekly participation is estimated at 30 minutes to 1 hour.

Lastly, you may document your MAPPS participation when filling out the PharmCAS application when it comes time to apply for pharmacy school.

Please do not hesitate to contact me if you have any questions.

I look forward to working with you!

Sincerely,
Sahar Adibi

APPENDIX E
RECRUITMENT FLYER



MAPPS

Mentoring Aspiring Pre-Pharmacy Students

Where we provide the tools and resources that help students map out their educational journey!

Have you ever considered pursuing a career in healthcare? Are you a pre-pharmacy student? Are you interested in exploring more about pharmacy and connecting with students and faculty at SSPPS? If you answered **YES** to any of these questions, then the MAPPS mentorship program is for you! Learn more about what the pharmacy field has to offer through a [free](#) mentorship program.

To register, please click [here](#).

What's Included

- ✓ Peer mentors
- ✓ Faculty Guidance
- ✓ Networking opportunities with SSPPS students, faculty, staff and current UC San Diego students
- ✓ Mentorship meetings, workshops and much more!

Date



Start Date: Monday, October 10th
End Date: Friday, November 4th

Location



The four-week program can be found on UC San Diego **CANVAS**

Contact Information:

E: saadibi@health.ucsd.edu | <https://pharmacy.ucsd.edu/>
IRB Approval: Arizona State University & UC San Diego



UC San Diego
Skaggs School of Pharmacy
and Pharmaceutical Sciences

APPENDIX F
SEMI-STRUCTURED INTERVIEW PROTOCOL

Interview Questions (semi-structured interviews)

****List of questions that I could pick from**

Thank you for taking the time to meet with me today. As you know, I am a doctoral candidate at the Mary Lou Fulton Teachers College at Arizona State University. The purpose of this conversation is to learn more about your journey through the MAPPS program so far.

The interview will take approximately 25 minutes. I would like to audio record this interview. The interview will not be recorded without your permission. Please let me know if you do not want the interview to be recorded; you also can change your mind after the interview starts, just let me know. The de-identified data as part of the current study will not be shared with other investigators for future research purposes.

Part 1- perception of pharmacy

1. Tell me a little about yourself
2. What does mentoring mean to you?
3. Why did you choose to be part of the MAPPS program?
4. Could you describe your impression of the MAPPS program so far?
5. What do you find most enjoyable about MAPPS so far?
6. When you hear the word, “pharmacist” what do you think of?
7. Before starting this program, tell me a little about what you knew about the profession of pharmacy?
8. What is something new you learned about the profession of pharmacy?
Has that information changed your perception of pharmacy?
9. Has participating in the MAPPS program thus far impacted your decision to pursue a career in pharmacy?

Transitioning to part two of the semi-structured interviews- focused on belonging

10. How long have you been at UC San Diego?
11. How has your experience been at UC San Diego thus far?
12. Have you felt a sense of belonging at UC San Diego?
13. Has participating in the MAPPS program thus far, helped you connect with other UC San Diego students? Has it helped you with connecting with SSPPS students?
14. What does it mean to “feel at home”? How does that feeling apply to your experiences at UC San Diego and more specifically in the MAPPS program?
15. Can you tell me about time when you didn’t feel like you belonged at UC San Diego?
16. Why is it important for you to feel a sense of belonging?

Transitioning to the last part of the interview- Self-Efficacy - some of these questions require you to state your agreement.

17. Do you find the weekly requirements to be manageable?
18. Do you believe your learning strategies are effective? Why or why not?
19. Do you feel confident asking questions and or asking for help?(if the participant states they disagree or strongly disagree, ask them why).
20. I have a good understanding of the science courses that will help me become a successful pharmacy student. (If the participant states they disagree or strongly disagree, ask them why).
21. I have enough resources to complete the MAPPS program. (If the participant states they disagree or strongly disagree, ask them why).
22. I am confident in my studying skills. (If the participant states they disagree or strongly disagree, ask them about their study skills).
23. What are some skills you are hoping to learn from participating in the MAPPS program?

APPENDIX G

STUDENT MEET AND GREET- BREAKOUT ROOM QUESTIONS

Group Discussions- Questions and Topics

Thank you for taking the time to meet with me today. As you know, I am a doctoral candidate at the Mary Lou Fulton Teachers College at Arizona State University. The purpose of this conversation is to learn more about your journey through the MAPPS program so far.

The interview will take approximately 25 minutes. I would like to audio record this interview. The interview will not be recorded without your permission. Please let me know if you do not want the interview to be recorded; you also can change your mind after the interview starts, just let me know. The de-identified data as part of the current study will not be shared with other investigators for future research purposes.

Before we get started: **Ice breaker questions**

1. Name
2. Favorite ice cream or favorite food item
3. Random fact

Part 1- perception of pharmacy

4. Why did you choose to join MAPPS?
5. What is something new learned about the profession of pharmacy?
6. Have you talked with your mentor yet? How was that discussion?

Part 2- Belonging

7. Have you built connections with other UC San Diego students?
8. What is something new you learned about our program?
9. Has there been a time where you felt disconnected from UC San Diego? If so, please explain.
10. Do you believe that mentorship programs help students feel more connected? If so, tell me more about that.

Part 3- Self-Efficacy

11. How are you all feeling about the program requirements? Is it manageable etc.?
12. How has your engagement experience been so far?
13. Program completion: At this time, do you believe you will complete the 4-week program? If not, tell me more about that.
14. Let's talk about UCSD resources: Before receiving an email about the MAPPS program, were you aware of the Pre-Pharmacy resources available on-campus?

Open the discussion for questions and comments

APPENDIX H

ASU INSTITUTIONAL REVIEW BOARD APPROVAL



EXEMPTION GRANTED

[Brian Nelson](#)
[Division of Educational Leadership and Innovation - Tempe](#)
 480/727-4550
Brian.Nelson@asu.edu

Dear [Brian Nelson](#):

On 7/8/2022 the ASU IRB reviewed the following protocol:

Type of Review:	Initial Study
Title:	The Effect of a Formalized Mentorship Program on Pre-Pharmacy Students' Perceptions of Themselves as Pharmacy Students
Investigator:	Brian Nelson
IRB ID:	STUDY00016086
Funding:	None
Grant Title:	None
Grant ID:	None
Documents Reviewed:	<ul style="list-style-type: none"> • Consent Document- Colleagues, Category: Consent Form; • Consent Document- Mentor , Category: Consent Form; • Consent Document- UC San Diego Undergraduate Students, Category: Consent Form; • Group Discussion Questions, Category: Measures (Survey questions/Interview questions /interview guides/focus group questions); • IRB Protocol Document - VERSION5, Category: IRB Protocol; • MAPPs Flyer, Category: Recruitment Materials; • MAPPs Participants- Interview Consent , Category: Consent Form; • MAPPs- Surveys , Category: Measures (Survey questions/Interview questions /interview guides/focus group questions); • Semi-structured interview questions, Category:

	Measures (Survey questions/Interview questions /interview guides/focus group questions); • UCSD Site Permission, Category: Off-site authorizations (school permission, other IRB approvals, Tribal permission etc);
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The IRB determined that the protocol is considered exempt pursuant to Federal Regulations 45CFR46 (2) Tests, surveys, interviews, or observation on 6/24/2022.

In conducting this protocol you are required to follow the requirements listed in the INVESTIGATOR MANUAL (HRP-103).

If any changes are made to the study, the IRB must be notified at research.integrity@asu.edu to determine if additional reviews/approvals are required. Changes may include but not limited to revisions to data collection, survey and/or interview questions, and vulnerable populations, etc.

REMINDER - Effective January 12, 2022, in-person interactions with human subjects require adherence to all current policies for ASU faculty, staff, students and visitors. Up-to-date information regarding ASU's COVID-19 Management Strategy can be found [here](#). IRB approval is related to the research activity involving human subjects, all other protocols related to COVID-19 management including face coverings, health checks, facility access, etc. are governed by current ASU policy.

Sincerely,

IRB Administrator

cc: Sahar Adibi
Sahar Adibi
Brian Nelson

APPENDIX I

UC SAN DIEGO INSTITUTIONAL REVIEW BOARD APPROVAL

Study Personnel

List the names of all UCSD/RCHSD employees conducting the research or acting as a point of contact on the study.

Instructions to add or update person.

- Click "+ Add Line" to insert additional person.
- Select the [Edit Pencil](#) next to a person to edit or update. Be sure to choose Permission as Full Permissions or Read Only for each person.

Person
ADIBI, SAHAR
Home Unit
Skaggs School of Pharmacy and Pharmaceutical Sciences
Institutional Title
Director of Admissions
Researcher Role
Principal Investigator
Permissions
Full Access

Study Personnel

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